Oasys Ltd Software Suite

Version 9.4.2

Update and Release Notes

Oasys Ltd

The Software house of Arup

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1 Introduction

The Oasys 9.4.2 suite of software, dated October 2010 is a bug fix release of the 9.4 software which itself superseded the 9.3 and 9.3.1 releases.

This document lists the enhancements that have been made during development of 9.4, the bugs that have been fixed (in 9.4, 9.4.1 and 9.4.2) and any that are known to remain. Each “case id” referred to in these lists is unique and should be cited if more information or clarification are required.

1.1 Compatibility with LS-DYNA releases

The 9.4.2 release has been used and tested with LS-DYNA version 971 release R4, supports all the keywords in the LS971 User’s Manual (except *CASE and *EF), and many of the keywords available in LS971 R4.2.1 that are not in the User’s Manual (e.g. *AIRBAG_PARTICLE). LS971 R4 is now the default keyword output format from Oasys PRIMER.

1.2 Hardware platforms supported

The complete Oasys 9.4.2 software suite is available on the following platforms:

Windows	2000, XP and Vista, Windows 7 XP 64, Vista 64, Windows 7 64bit	32 bit 32 and 64 bit
Linux 2.4 kernel	RedHat 7.3	32 bit only
Linux 2.6 kernel *	Suse 9.0 and 10.0	32 and 64 bit
	Redhat Enterprise 4.0	32 and 64 bit
	Redhat Enterprise 5.0	32 and 64 bit
HP PA-RISC	HP-UX 11.0 and 11.11	32 and 64 bit
HP Itanium	HP-UX 11.23	32 and 64 bit
Sun	Solaris 8 and 10	32 and 64 bit
Silicon Graphics	Irix 6.5	32 and 64 bit
IBM	AIX 5.1	32 and 64 bit

- We build Linux 2.6 kernel versions on both SuSe and RedHat however we have found that the executables seem to be completely interchangeable with no problems or loss of performance.

1.3 Graphics hardware supported

The default graphics protocol used on all platforms in the table above is OpenGL, which gives good quality 3D performance on a wide range of hardware.
“Legacy” X-Windows (2D only) graphics drivers remain in PRIMER and D3PLOT on Unix and Linux platforms since these are used by a small minority of clients who display over a network of mixed machine types.
The 2D X-Windows driver has been withdrawn from T/HIS for technical reasons, however it is now linked with both hardware OpenGL (the default) and the MESA emulator on UNIX and Linux. MESA emulates OpenGL in software on X-Windows; therefore clients using a mixed machine environment with only 2D X-Windows support will still be able to display graphics.

1.4 Contents of the release

The Oasys Suite 9.4.2 is a complete set of the Oasys LS-DYNA Environment software. In the previous release (9.3.1) a separate build of D3PLOT supporting files compressed using FEMZIP was provided on some platforms. From version 9.4 onwards the capability to read FEMZIP files is built into the standard version of D3PLOT.

1.5 FLEXlm Licensing

Due to a change in the licence file format, when upgrading from 9.3 to 9.4.2 you will need a new licence file to run the software. If you have already installed 9.4 or 9.4.1 no license change is required to run 9.4.2.

The version 9.4.2 software has been compiled using version 10.8 of FLEXlm (the same version as 9.3) so you do not need to update your FLEXlm licence servers.

The new version 9.4.2 licence file and licence daemons are backwards compatible with the 9.3.1 (and earlier) software releases.

However, on UNIX and LINUX, to run 64 bit versions of 9.3.1 (and earlier) you will need to replace the file flcheck93.exe in the 9.3 installation directory with a new version of flcheck93.exe provided with (but not used by) the 9.4 installation. The 9.3 software will then work with the new licence file format.

2 Bugs

The enhancements and bug-fixes for each program have been broken down into a series of topics. Within each topic enhancements and bug-fixes are listed by case ID (most recent first).

2.1 Oasys PRIMER

2.1.1 Bugs Fixed in 9.4.2

Assembly

- **Case 15916**

Recursive subset definitions are illegal in Primer. If a model was read which contains them, Primer was liable to get stuck in a loop when part tree assembly button was accessed or otherwise. A necessary break out has been added.

- **Case 15769**

The name of the group could be lost when reading ANSA comments in a Dyna deck and converting to Primer assemblies. This has been corrected.

- **Case 15707**

Use of extra data files in model build was not working correctly, giving the error 'cannot find include file relative to root'.
This resulted from an error constructing the include_path definitions for model build.

Belts

- **Case 16081**

It was found that 1D seatbelts can give the wrong force transfer across sliprings in LS-DYNA, if the topology numbering of the seatbelt elements is not sequential in the elements attached to the slipring.

This means that the topology ordering

[N1--- belt #1 ---N2] [Slipring] [N1--- belt #2 ---N2]

will give the correct results, but

[N2--- belt #1 ---N1] [Slipring] [N1--- belt #2 ---N2]

will not. In other words seatbelt elements must all have sequential topology in the order N1->N2, N1->N2 (or N2->N1, N2->N1) but not N1->N2, N2->N1 (or N2->N1, N1->N2).

PRIMER's seatbelt meshing follows the correct sequential order in all except one case, which is at end #2 of where a mixed shell / 1d belt section meets a slipring. This typically occurs at the base of the chest section of belt where it meets the pelvis slipring.

This has now been changed so that all sections of 1d belt elements are meshed in a sequential topology order where they pass through slip ring.

1D-only belt meshes, and 2D belt element meshes, were already created with sequential topology.

In addition a check for this problem has been added to the standard 'check' function for sliprings, with an associated 'autofix' that will reorder topology as required to correct the problem. This check + autofix (if necessary) is also called on keyword input, so that any decks that contain this error are

corrected automatically when read in. These checks will work on any 1d seatbelt mesh, not only those generated by Primer.

- **Case 15579**

When an existing 2D belt (shells, 2d seatbelts, or a mixture of the two) is regenerated it is normally the case that any sliprings and retractors are reused, and this works correctly.

However if the user chooses to delete the existing definition then there is an error in the subsequent slipring creation which results in the 'far' end of a belt segment not 'knowing' about the slipring, although the 'near' end of the next segment handles it correctly.

Done once this results in errors in the slipring because the set of shells on end #1 is empty. If the delete/generate process is repeated then a crash occurs as a result of this.

This has been fixed.

- **Case 15468**

When seatbelt fitting, the belt node (for 1d belt elements) at the pelvis slipring location was created at a location not quite coincident with the slipring node.

This because of the erroneous assumption that the end of the belt would be flat and square at such a slipring, meaning that the average coordinate of nodes at the point would equal the centre node position.

In practice some wrinkling of the belt path occurred because of nearby structure coming into contact, meaning that this assumption was not true. The error was small, but enough to exceed the permitted tolerance. The problem has been fixed.

- **Case 15174**

There was a bug in seatbelt fitting which would only show up rarely, but when it did the mesh near a pelvis slipring was likely to 'blow up', or at least look strange, during fitting.

This was due to an error in the way the belt path's reversal at this sort of slipring was handled in the fitter, and would be most likely to show up if there were some 'structure' elements near the slipring.

This has now been fixed.

- **Case 15173**

Typing in your own value for 'Seatbelt ID' when creating a seatbelt definition may not work. This has been corrected.

Checking

- **Case 15433**

Primer no longer issues error messages if E on *MAT_071 is defined as zero (in LS-DYNA, this means constant force in the cable)

Primer also refrains from issuing error messages if a beam section made of a *MAT_071 with E set to zero has CA also set to zero.

- **Case 15305**

A spurious error message for _TIEBREAK contacts with type OPTION set to 4 and SFLS set to 0.0 is no longer displayed during checking operations.

- **Case 15159**

Primer could get 'stuck' while carrying out a model check if the model contains DEFINE_TABLE's that are referenced by more than one material.

- **Case 15060**

Primer no longer issues an error message if *MAT_NULL is used for a beam section with ELFORM = 6.

- **Case 14985**

If a model contained a 10 noded tet element part, which was also included in a database cross-section definition, model checking sometimes resulted in a crash. The problem has been fixed.

Comments

- **Case 15009**

Comments at the top of an Include file would be lost during a keyin from include files that did not start with *KEYWORD. This has been corrected.

Connections

- **Case 15749**

Connection options were incorrectly being greyed out when a model contained no spotwelds. The workaround for old versions is to create a single weld.

- **Case 15642**

In cases where a connection node is tied exactly on the border of a pair of adjoined shells of different parts, Primer could incorrectly report the status of the connection as invalid with the error UNTIED LAYER.

- **Case 15137**

If a node on one spot-weld beam is used as the third node on another spot-weld beam, the logic which automatically creates connection entities from existing welds could fail to work. This has been corrected.

Contacts

- **Case 14996**

Primer's Contact Modify panel no longer discards values entered in the '<_type> data' sub-panel when modifying contact definitions of type _TIEBREAK_NODES_ONLY.

Contour

- **Case 15994**

Previous versions of Primer would contour plastic strains using *INITIAL_STRESS_SHELL correctly, but not if the _SET option were invoked. This has been fixed.

Database

- **Case 14973**

The 'Create' button was greyed out when initially opening a DATABASE_CROSS_SECTION creation panel, even though the fields are automatically filled based on the model contents. You needed to click on a seed node to un-grey the create button. This has been corrected.

Dummies

- **Case 15388**

During dummy and mechanism positioning a crash could occur if:

- Contact between one or more assemblies and structure was being used in the positioning
- Duplicate contact segments occurred in the contact

This would not always happen, and it could be worked round by avoiding specifying duplicate structure for dummy assembly or structure being contacted. For example if shells overlaid solids then specifying only the shells or only the solids would cure the problem.

- **Case 15298**

If a model contained more than one dummy definition, and the dummies (as a whole) had been rotated so that they had cosines specified, and then the model is written out, the tree file (section between *DUMMY_START and *DUMMY_END) for the second dummy would be omitted.

Error trapping

- **Case 15068**

When using MAT_002 with the Anisotropic option, PRIMER no longer displays error messages if C12, C13, C23, C14, C24, C34, C15, C25, C35, C45, C16, C26, C36, C46, C56 are less than 0.0.

FMH

- **Case 15644**

If you built multiple IHI models using the 'Build from CSV' feature AND you specified a positional node AND you chose to delete the models in Primer as you progress through the build, models created after the first one could be in the wrong position. This has been corrected.

Graphics

- **Case 15092**

A 'reverse' of blanking (e.g. keyboard 'R' shortcut key) could be quite slow for a big model. This has been improved.

IPP

- **Case 15498**

IPP units change for velocity parameter has been fixed.

Include

- **Case 15743**

When carrying out the following steps, the original filename stored with the model could be lost. This would only have an effect if you wanted to get that filename back (for example in a JavaScript).

- Quick scan a model containing include files.
- Select to read in the root file and one of the includes.
- Now open up the include tree. Right click on a include you did not read during step (2) and select 'Read' in the popup. That include file will read. The original model filename information has now

been lost, so wrong information would be returned from the JavaScript function that returns keyword filename.

The issue has been corrected.

- **Case 15693**

The include file could not be changed in an edit panel that had been opened from a field on the generic keyword edit panel. This has been corrected.

- **Case 15114**

Primer could crash when scanning for include files if one of the files did not exist. This has been fixed.

Include transform

- **Case 15744**

When a DEFINE_BOX is included in an include transform rotation, Primer was not updating the box in the same way as LS-DYNA if the box was rotated such that the original definition led to an inside out or negative volume box. This has been corrected.

Keyword

- **Case 16156**

If a table definition is read with SFA and/or OFFA defined as non-zero and the model is keyed out in a LS-Dyna version which does not support these parameters, Primer will apply them directly to the table values. If the value of SFA was zero, this resulted in zeroing of all the table values. In this context zero should be treated as 1.0.

- **Case 15858**

The keyword editor for SENSOR_DEFINE could crash on some platforms.

- **Case 15734**

A bug that would stop Primer from reading *INITIAL_TIED_CONTACT_DATA cards has been fixed

- **Case 15473**

Primer was writing out *DEFINE_ELEMENT_DEATH with '_TIME' incorrectly added on the end. This is now fixed.

- **Case 15254**

An error could occur if the keyword editor was used to edit a beam's topology list. The symptoms could include node N2 being set to zero, or other unpredictable effects elsewhere in the code - probably harmless in most cases. This error has been fixed.

Keyword editor

- **Case 15985**

*INITIAL_STRESS_SHELL with Large Format option was neither writing out correctly nor editing correctly in the keyword reader. This has now been fixed.

- **Case 15947**

The only value you were allowed to type into the ALPHA field of *CONSTRAINED_GENERALIZED_WELD with the CROSS_FILLET option in the keyword editor was 360. Fixed now.

- **Case 15014**

Fixed a bug that would prevent option 'VOLUME_LOSS' from appearing under KEYWORDS->LOAD despite the prior availability of the keyword editing panel itself.

- **Case 14971**

A crash could occur in the keyword editor for shells if the _DOF keyword suffix was turned on for triangular shells. A similar crash could occur for solids if _DOF was turned on for solid tetras or wedges.

Local axes

- **Case 15395**

Local material directions would fail to be displayed in certain cases for shell elements. This has now been fixed.

- **Case 15390**

Local element directions would be drawn incorrectly for some elements on HPUX11 machines. This has now been fixed.

Macro

- **Case 15819**

Using 'Shift' or 'Ctrl' to select entities in the part tree contents list panel worked, and correct commands could be recorded to a macro, however, the 'Shift' and 'Ctrl' were not recognised during the macro playback. This has been corrected.

Mass

- **Case 16097**

The total part mass at the bottom of the Include File summary information written to a Primer summary file was incorrectly writing the timestep added mass instead of the part mass. This has been corrected.

- **Case 15026**

Two potential errors have been found with solid element timestep calculation which may also affect the added mass.

- If *CONTROL_HOURGLASS is defined, Primer is incorrectly using the parameter QH in the timestep calculation for any solid parts which do not have hourglass card explicitly defined. The problem may be averted by setting QH=0.06 or de-activating the card.

- The calculation for degenerate pentas was incorrect. If the preferred setting of ESORT=1 on *CONTROL_SOLID is applied, this error will not occur as the proper element formulation will then be used.

Materials

- **Case 15257**

The following material model bugs have been fixed:
- MAT_004: The first parameters of each row were not being checked for negative values.
- MAT_027: Poisson's ratio is checked for valid range.
- MAT_181WF: Speed of sound is now correctly calculated for this material.

- **Case 15059**

Suppressed spurious error message regarding zero mass density for *MAT_WINFRITH_REINFORCEMENT

- **Case 15057**

If a model contained material *MAT_WINFRITH_CONCRETE_REINFORCEMENT, the material keyword editor would fail to initialise, and would crash on exit.

- **Case 15036**

Primer now reads in *MAT_040 cards with or without the optional line 6.

Mesh

- **Case 16003**

Primer could crash if using 'split with line' to split a quad shell element into 2 triangular shell elements if the nodes affected were in a node set. This has been fixed.

Model build

- **Case 15359**

For the upper pedestrian legform file type, Primer would require specification of valid mass parameter and values. The specification of these fields is no longer mandatory.

Nastran

- **Case 15735**

A bug has been fixed in the Nastran input translator that would occasionally cause 'missing data' errors when reading some 'wide' format cards with completely blank lines of data.

- **Case 15094**

Primer could stop writing out a Nastran deck if it was writing out a model that contained a rigid part with no elements. This has been corrected.

Orient

- **Case 16057**

Orienting of joints (i.e in the Orient menu, select using object type Joint) did not work. This has been corrected.

Parameter

- **Case 16157**

When parameters were used on *MAT_EROSION or *MAT_PERMEABILITY cards these could be lost when read into Primer, although the value of parameters would be applied correctly to their data fields. This has been fixed.

- **Case 15760**

A problem arose with parameters on keyword output if, and only if:

- A parameter_expression was used in an include file referenced by *INCLUDE_TRANSFORM

and

- This parameter expression referenced another parameter defined outside the include file itself

and

- This parameter was referred to within the include file.

In this situation the special logic used when applying inverse transforms prior to keyword output failed to evaluate the parameter correctly. This led to there being a mismatch between the data value in the fields where this parameter was used and the (wrong) value of the parameter itself.

Where such a mismatch occurs Primer replaces the reference to the parameter with the underlying value, which was numerically correct in this case but not what was required.

This bug has been fixed.

- **Case 15129**

Parameters were not being displayed/inserted correctly if referenced by *PERTURBATION_NODE. This has been corrected.

- **Case 15118**

Primer could print an error when modifying a parameter reference by a *PERTURBATION card. This has been fixed.

- **Case 15052**

In *PARAMETER_EXPRESSION, reference to another parameter using & could cause problems. For example if an expression referred to the parameter 'other' then

expression **1.5 * other** would be written out correctly
but expression **1.5 * &other** would substitute the value of 'other'

This could cause further problems if the definition of the parameter 'other' appeared later in the input deck, or the deck was split up into include files and the value of 'other' could vary in different files.

This has now been corrected.

- **Case 14961**

The sequence:

(1) Open the keyword editor on some definitions that use parameters.
(2) Change one of the definitions
(3) Change the value of a parameter used on that definition, and 'update model'
(4) Reset the editor row, or Cancel from the editor

Breaks the association between the modified parameter and the field in which it is used. This has now been fixed.

Part table

- **Case 15757**

The following sequence of JavaScript controlled operations was found to give incorrect part mass value in models with *ELEMENT_MASS_PART(_SET) definitions.

- write out Part Table using JavaScript command line call
- modify mass of a part used in the *ELEMENT_MASS_PART definition
- write out part table using JavaScript command line call

The problem does not occur with interactive use of the part table.

Part masses are now unconditionally recalculated when the Part Table is called in command line mode.

- **Case 15050**

If you selected multiple parts in more than one model in the Part Table, Primer would allow you to (for example) select parts from two models, and change the 'gauge' field to &THICK (where THICK is a new *PARAMETER). However, the parameter THICK would be installed only in the first model, causing problems. You can now add parameters to fields only when all the parts selected belong to the same model.

Part tree

- **Case 15924**

When displaying the part tree in contents mode, it was possible to see two rows for *DATABASE cards. This has been corrected.

- **Case 15894**

A bug has been fixed that, after creation of a DATABASE_ASCII_ or a LOAD_BODY card in Primer, would result in the listing of NODES in the CONTENTS mode of the Part Tree even if the model contained no nodes.

Penetrations

- **Case 15025**

When using the function to select 'interacting nodes' for crossed edge fixing on a contact which contained different element types on the master side and slave side (for example, solids and shells), a crash could occur. This has been fixed.

Read

- **Case 15939**

When using quick scan, if the file being scanned defined *INCLUDE using lowercase (for example *include) then the referenced include would not appear in the tree view. This has been corrected.

- **Case 15938**

PRIMER would get stuck in an endless loop during a keyword read operation if a *DATABASE_HISTORY_xxx_LOCAL definition contained one or more blank lines.

- **Case 15091**

Primer could not read *CONSTRAINED_INTERPOLATION_LOCAL. This has been corrected.

Renumber

- **Case 15410**

PART_COMPOSITE material data could become corrupted when using the Renumber->Condense Mats function. This has been corrected.

- **Case 15407**

When using the renumber MID->PID function, if the model contains *PART_COMPOSITE cards it was possible for part cards to be deleted or multiple materials to end up with the same label. This has been corrected.

Scripting

- **Case 16103**

The return of the 'id' field of the ExtraNodes class in JavaScript was incorrect. This has been fixed.

- **Case 16086**

The JavaScript functions RigidBodies.GetAll() and ExtraNodes.GetAll() did not work, and could cause Primer to crash. This has been fixed.

- **Case 15920**

The Edit() function in the Curve class did not work and caused Primer to crash. Now fixed.

- **Case 15817**

If a user ran an encrypted script and then tried to run a normal script it would fail with an error. This is now fixed.

- **Case 15811**

The 'mid-node' option for the model member function ModelMerge did not work. Corrected now.

- **Case 15318**

Primer could give an error message when using the 'KeywordCards' function for parameters when using JavaScript. This has been corrected.

- **Case 15148**

It was not possible to create a *DATABASE_CROSS_SECTION_PLANE with the CrossSection constructor. Now fixed.

- **Case 14995**

Calls using the RenumberFlagged method in Primer's Solid JavaScript class would previously produce erroneous results. This has now been fixed.

- **Case 14989**

Previous versions of Primer would not permit definition of *INITIAL_VELOCITY_GENERATION cards of type PART_SET or NODE_SET using JavaScript. This has now been rectified.

Seatsquash

- **Case 15243**

Fixed an issue with seatsquash using the dialogue box commands. Occasionally extra entities could be selected erroneously for the first selection using the 'select' command.

Selection

- **Case 15084**

Selecting an item in the BLANK menu, and then pressing APPLY results in the object (selection) menu and any associated filter being reset to their initial state. The object menu and filter in this context will now remain, and it will be necessary to select a new OBJECT TYPE if something different is to be blanked subsequently.

- **Case 15082**

When a part was referred to (indirectly) in a *SET_PART_ADD definition the 'Filter by part set' option in object menus would not find it. This has now been fixed.

Sets

- **Case 15814**

A crash could be provoked when adding data to the SET_GENERATE panel. This has been corrected.

- **Case 15029**

Primer will now sketch segment set contents when selecting 'Remove segments' on the set edit panel. This will allow the user to pick the segments from the screen to remove.

Units

- **Case 15258**

The units of the field HU on MAT73 (*MAT_LOW_DENSITY_VISCOUS_FOAM) were incorrectly set to STRESS, meaning a units change on the model changed this field unnecessarily. This has been corrected.

- **Case 15065**

The load-curves for Material type 202 and a small number of other *MAT cards had the units for their X and Y axes swapped. This would lead to wrong conversion of units, and misleading axis labels in the load-curve editor. These have been fixed.

- **Case 15042**

Primer would incorrectly convert the units of the specific heat capacity field on 3 material types (15 - JOHNSON_COOK, 107 - MODIFIED_JOHNSON_COOK and 113 - TRIP). Previously the units were considered to be energy/temp when they should have been energy/mass/temp. This has been corrected.

Write

- **Case 15224**

The length of string you can type in the dialogue box has been extended. Previously the limited length would mean that you could not write out long filenames when using 'write dk'.

Xref

- **Case 15495**

If the cross-references editor was used in the following way:

- Highlight a reference row
- Right click, edit
- The item only has a keyword editor option, so this panel is started
- Dismiss the parent x-refs panel

Then the keyword editor panel would be left on the screen as an unresponsive 'orphan' with no means of dismissing it, because it would no longer respond to user input. This has been fixed.

Ztf

- **Case 15496**

When using the -ztf command line option, Primer would only be able to process keyword files with the .key extension. This has been corrected.

2.1.2 Bugs Fixed in 9.4.1

Airbag

- **Case 14781**

Primer could apply incorrect scale factors to the gas coefficients A, B and C on AIRBAG_ALE, AIRBAG_ADVANCED_ALE and AIRBAG_PARTICLE cards upon a units change operation. This would also affect the same coefficients defined on *MAT_148(GAS_MIXTURE).

Airbag folding

- **Case 14620**

When typing in values for an origami or fold local coordinate system it was not obvious what the values were. It looked like you were typing in the coordinates of N1, N2 and N3. Actually the textboxes are showing the origin (n1), local x unit vector and local y unit vector.
The position and text of the buttons has been changed to make it clearer and some hover text has been added.

- **Case 14619**

When using the airbag folder, entering a fold point using the textbox for the first time did not update the plot so the user had to press 'enter' again.

Assembly

- **Case 14566**

Model build with orientation points can fail to apply the orient properly when multiple models are being built off the same database build tree. This was due to a failure to initialize some data used by the process which matches slave and master orient points.

- **Case 14565**

When building models from template build panel or using the Instrument Panel Pendulum feature, if the .lst file already exists, a text box will appear to warn the user that it will be over-written. Unfortunately the 'abort' option does not work and the file will be over-written regardless. In the case of build from csv file, the option is correctly handled.

- **Case 14562**

The use of 'stop' function during the phase of model build which is checking for any changes in the model in memory with respect to the on disk files, can lead
to a crash in the process if the stop event occurs during keyin phase.

Attached

- **Case 14560**

In Find Attached the logic may fail to 'track' across a tied contact if it is defined by Part or Set part.

Belts

- **Case 14675**

The command-line interface to the seatbelt fitter could cause a crash in the 'Select BELT' syntax if the belt specified did not exist. This was due to a formatting error in the message reporting that the belt specified had not been found, and the problem would not occur if the belt actually existed.

Checking

- **Case 14860**

Primer9.4 was programmed to allow a Part-Set to contain a Nodal Rigid Body. It appears, however, that this is only legal in LS-Dyna for LOAD_BODY_PARTS. An error message will now appear if such a set is used in any other context.

- **Case 14635**

Primer would generate a spurious error message about sets being referenced without first being defined. This message would be encountered if the model contained a *LOAD_THERMAL_VARIABLE_BEAM card with the _SET option turned on.

- **Case 14564**

In 9.4.1 there have been a number of corrections to the handling of the keyword *ELEMENT_MASS_PART when target mass is being specified for a set of parts
- the mass distribution across the parts has been corrected to be an area weighted distribution of the portion of mass that exceeds the sum of the nominal part masses
- a spurious error message about duplicated definitions has been stopped
- definitions which contained large numbers of parts in the set were excessively slow to calculate due to un-necessary repeated calculation of the part structural mass.

- **Case 14505**

Spurious warnings about *ELEMENT_MASS_PART labels being out of range have been prevented. This keyword has no external label.

Coating

- **Case 14758**

The COAT panel can be opened in a special mode (segment coat only) via the SET_SEGMENT panel. Dismissing the SET panel would not automatically dismiss the child COAT panel in this case. Any subsequent updates to the COAT panel could result in an error in Primer. The COAT panel, if started via the SET panel, is now dismissed when the parent SET panel is dismissed.

Connections

- **Case 14884**

When remaking MIG weld connection types, it is possible for the 'free end' node to be renumbered and therefore no longer referenced in a tied contact node set that may be set up.
Remaking/updating the connection using connection->contact will solve the problem, but the logic has now been updated so that the node is no longer relabelled upon a remake.

- **Case 14817**

Primer could hang when remaking connections where the layers are defined using assemblies.

- **Case 14777**

Primer could hang if creating MIG welds along a free edge of a part with multiple free edge paths.

- **Case 14746**

It was possible to end up with a mis-match between connection layer PID's and element beam _PID's if you performed the following operations:
- read in a model that contained spotweld beams with _PID and a tied contact, but no Primer connection entities.
- change the _PID values on the element beam edit panel.
- then click on 'Connection' to create the connection entities.

- **Case 14728**

When using 'Find unconnected' in the connections panel, adhesive parts may be left on the screen even if they join panels together.

Contacts

- **Case 14924**

In PRIMER 9.4 threading was introduced to parallelise and hence speed up contact penetration checking. We have since found that the run-time library on RedHat7.3 (a Linux operating system released in 2002) does not support this correctly which can lead to the process 'hanging' during contact checking.

This only affects the 32 bit Linux 2.4 kernel build, and then only if that executable is run on a machine with the (now very old) Linux 2.4 kernel. Running the same executable on a later version of Linux appears to work correctly.

In release 9.4 the work around is to set the environment variable PRIMER_NUM_THREADS to 1, inhibiting threading of contact checking.

In 9.4.1 threading has now been disabled in the Linux 2.4 kernel build.

(All other Linux builds [RHE 4, SUSE 9, RHE 5] which use the 2.6 kernel were not affected by this problem, and are unchanged in this respect.)

Contour

- **Case 14699**

Primer would occasionally overlay the text 'No plastic strains' over the slider in the Contour element properties 'Settings' panel.

- **Case 14660**

The shell thickness plot could appear spotted, because the shell thickness algorithm assigned numerically different thickness to tria and quad elements (e.g. 900.0e-3 and 899.999e-3) which were really the same. This resulted in a discrete plot with elements of the same part in two different bands. The problem has been solved by rounding the value of thickness.

Database

- **Case 14791**

A bug in the *DATABASE_FSI editing panel that could crash.

- **Case 13954**

In the DATABASE_CROSS_SECTION editing panel, dragging of cross-section planes in the normal direction along feature lines should now work better over large distances and along curved lines. Also, the restriction on dragging cross-section planes in opposite directions has now been done away with.

Deleting

- **Case 14852**

The node(s) in a CONSTRAINED_SPR/SPR2 node set could be deleted during a model cleanup.

- **Case 14806**

When deleting items the panel gives the user the opportunity to LEAVE one or more categories. If the selected category was of static type (e.g. CONTROL) this could cause a SIGSEV report when the deletion was applied.

Dummies

- **Case 14528**

The command-line (batch) specification of Dummy assembly angles was not working properly.

The syntax /DUMM; ASSEMBLY ; RY

Should have rotated the assembly in the dummy *TO* angle , however it appeared instead to rotate it *BY* angle .

This was because the initial (current) angle of the assembly was not being computed before the required to achieve was worked out. Since the initial angle was always zero this gave the impression of relative movement.

(This was only a problem in pure command-line / batch mode. If the dummy was positioned interactively the initial angles of all assemblies were computed correctly in order to build the display in the user interface menu panel.)

This has been fixed: in batch / command-line mode the current angle of an assembly is now computed *before* calculating the by which it needs to be moved to achieve the desired result.

Graphics

- **Case 14774**

If the X-Windows graphics driver was used in 9.4 then D3PLOT and PRIMER would crash if a Postscript or PDF file was generated.

- **Case 14856**

The 193.x graphics driver from NVidia (Dec 2009) seems to produce spurious lines in wireframe, hidden or full overlay plots for some models in Primer. This occurs on both Windows and Linux.

There is no obvious reason why this should be so, and the cure appears to be to limit the length of a stream of similar graphics primitives sent to the graphics card, which suggests a bug in the NVidia OpenGL drivers.

However this 'fix' does not have any observable impact on the graphics speed of
Primer so it has been made a permanent fixture of the code which, hopefully, will avoid the problem in the future.

- **Case 14816**

Primer could - rarely - 'lose its lighting' in an image refreshed from backing store. The problem showed itself as an image that had no lighting following a screen refresh from backing store.

This happened following a complex series of operations, and the exact cause has not been determined, although it was demonstrably causing an error in the OpenGL graphics driver.

- **Case 14794**

Normally when something that can be drawn is created in an editing panel (either single item or generic keyword editor) PRIMER will turn on its entity visibility switch so that it becomes visible. This was not working for *LOAD keywords.

- **Case 14752**

The following bug was found in screen-picking (either selection of individual items or by area).

Perform a data-bearing (e.g. contour) plot
Then blank some items from that plot
The pick in the area where the blanked items were

The blanked items may be selected even though they are not visible.

This would only happen if a data-bearing image was subjected to further blanking, normal (e.g. LI, SH) plots would not be affected.

- **Case 14579**

If after using another application you went back into PRIMER,D3PLOT or T/HIS and then pressed SHIFT followed by Left Mouse then instead of starting dynamic viewing you would end up activating the current Quick Pick option.

Include

- **Case 14906**

Primer would fail to read in include files where the first character of the include filename was '.'.

- **Case 14581**

'Decrease depth' did not work correctly on the model -> build from database panel.

- **Case 14447**

The function 'add new child with transform' has been blocked from attempting to add a file which itself has includes. This is not supported in Primer, and the attempt could cause SIGSEV.

Installation

- **Case 14861**

On Windows platforms the graphical Oasys software (PRIMER, T/HIS, D3PLOT) normally writes log output to a console window. However some security software can prohibit applications from opening a console, and this can stop the software from running.

Therefore a '-eo(=filename)' command line argument has been added which will suppress the console window and instead send log output to a file.

The environment variable OASYS_NOCONSOLE will have the same effect.

Keyword

- **Case 14867**

*INTERFACE_SPRINGBACK cards followed by a list of nodes were being incorrectly read as multiple Interface keywords due to an error introduced into 9.4.

- **Case 14637**

When type was changed from node/set in edit panel for *CONSTRAINED_EXTRA_NODE the entry was not being cleared. This could result in a SIGSEV if one then tried to edit the entry. The old entry is now cleared when the type is changed.

Kwd editor

- **Case 14454**

The *BOUNDARY_NONREFLECTING_2D keyword editor no longer gives spurious error that the node set it refers to is not defined.

- **Case 12827**

It is now possible to bring up the generic keyword editor for *DATABASE_HISTORY_NODE_LOCAL from the Part tree in CONTENTS mode.

Macro

- **Case 14949**

Recording a macro could record the wrong popup window number if a popup window used hover text.

- **Case 14941**

Macros could sometimes not play back correctly for button presses if the press would map a window at the cursor location.

- **Case 14928**

Playing a macro in the keyword editor would crash if the keyword editor did not have a slider (i.e. if there were less keywords than available rows in the keyword editor).

- **Case 14795**

If an error occurred when playing a macro from a JavaScript the script could be left hanging.

- **Case 14788**

Macros could fail to play correctly for the overlay style button in the display options panel.

- **Case 14787**

Shortcut keys were not recorded to a macro if the mouse was in the macro window.

- **Case 14771**

Popup() commands in macros could fail on playback for popups mapped at the cursor (e.g. when right clicking on the part tree or part table).

Manual

- **Case 14748**

*MAT_WOOD was not handled correctly by Primer. Problems would be seen when reading or writing.

Mass

- **Case 14563**

When the Assign mass function is used to automatically create groups from selected parts, the include for the group should be the include selected for the assign mass itself, not necessarily the current layer.

Materials

- **Case 14829**

Units in the editing panel for MAT_027 have been fixed.

- **Case 14671**

The MACF and REF fields were missing in Primer for MAT_002. These have been added.

- **Case 14576**

A spurious error message from the MAT_192 keyword editor that the third row was blank or full of zeros when parameter THEORY was greater than 0, has been removed.

Nastran

- **Case 14710**

The NASTRAN input translator now ignores all data preceding the 'BEGIN BULK' statement in the input NASTRAN deck. This also ensures that NASTRAN case control statement 'SPC = xx' does not result in extra constraints when reading in
NASTRAN bulk data input files.

Orient

- **Case 14888**

The affine (POS6P) option for *DEFINE_TRANSFORMATION was not implemented correctly in 9.4. Primer only permits one such definition per transform.

- **Case 14687**

Contact orient across models, i.e. when the orientee parts are in one model and the contact parts are in another may refuse to run with error message 'contact parts are flagged for orient'.

Part table

- **Case 14804**

The use of command line 'part_info >> write' could cause Primer to crash due to a failure to initialize the data structures for smallest element and smallest element timestep.

Part replace

- **Case 14958**

The re-attach node function of part replace was not always working correctly for cases where the replaced part was of type other than shell.

Part Tree

- **Case 14510**

Primer could crash when deleting assemblies in the part tree when Primer contains multiple models.

Penetrations

- **Case 14718**

When deselecting nodes for penetration fixing, Primer was incorrectly greying the APPLY and DRAG buttons when other nodes were left selected.

Preferences

- **Case 14919**

Using Options > Menu attributes in PRIMER, D3PLOT or T/HIS makes it possible to configure dynamic viewing to be like other codes. The selected configuration can then be stored in the oa_pref file.

There was an error writing these preferences that could result in

*dynamic_...

preferences being written which were incorrect. (These were the original names used during development, which became superseded for release, but some occurrences of the old names were not removed from the code.)

These have now been corrected, and the proper

*dv_...

preferences will be written.

- **Case 14582**

Pressing Cancel in the 'Save As' dialogue box in the preferences editor closed the preferences editor instead of just cancelling the save.

Quick pick

- **Case 14917**

Display of the part information quick-pick panel could be rather slow on older machines for very large models with complex mass definitions.
A preference has been added to turn off the mass calculation in this context.

Read

- **Case 14753**

Primer could crash if reading duplicate materials into a 64 bit version. Note this may also occur with duplicate thermal materials, equation of state cards and section cards.

- **Case 14556**

Primer now gives a more informative error message if a keyword file cannot be read because of an extra blank line being present.

Scripting

- **Case 14868**

Calling Window.UpdateGUI() to update a GUI for a computationally intensive script sometimes did not work correctly on Windows.

- **Case 14803**

Using the function Graphics.DrawingFunction(null) to try to unregister a drawing function gave an error and caused the script to terminate.

- **Case 14792**

A macro could only be called from JavaScript once (as the first macro did not exit cleanly).

- **Case 14717**

If you called the Sketch() member function for an object then instead of sketching the object, the object was shown with marking symbols. The proper sketch is now done.

- **Case 14700**

For Javascript Mass class the 'label' property points to the wrong thing (it points to ID (node) instead of EID).

- **Case 14678**

The multi-dummy positioning script provided in
$OA_INSTALL/primer_library/scripts/multi_dummy_position.js would fail to set up
a model if a Primer belt refit was used to fit a belt and the belt definition label was not 1.

An option has been added into the GUI to specify the belt definition label. This can be saved and loaded from the csv file like all the other variables in the GUI.

- **Case 14664**

The javascript used to read in LSTC dummy files could give an error message after reading the file in.

- **Case 14657**

If the user used History.Create() from JavaScript to create a history node/shell, etc. the function would not return to the script when 'CREATE' was pressed.

- **Case 14656**

A hanging window was left after using CrossSection.Create() from JavaScript.

Selection

- **Case 14785**

The 'feature line' picking of nodes worked correctly for nodes picked on the surface of a 2D mesh of elements, but wrongly on a mesh of 3D element.

This was due to an internal error selecting and then propagating the correct 3D element face.

Sketch

- **Case 14805**

The sketch function for *DEFINE_BOX when applied to boxes with ill conditioned definitions (i.e. MAX < MIN) was failing to show that the box was effectively flat.

User interface

- **Case 14701**

In the top level tools panels (e.g. MATERIAL) in Primer the message shown when nothing had been selected for the current operation (e.g. modify) was 'nothing defined'.

This was misleading since it made it appear that no definitions of the relevant type existed, whereas what it should have said was 'nothing selected'. So it has been changed to that.

Write

- **Case 14782**

Primer could incorrectly keyin or incorrectly keyout *BOUNDARY_FLUX cards if the number of extra constants contained on the card was exactly divisible by 8.

2.1.3 Bugs Fixed in 9.4

Airbag

- **Case 13931**

PRIMER would give an error message if the IDA and ADG fields on a *AIRBAG_ALE card referenced latent parts. This is however valid.

- **Case 13930**

When orienting the parts referenced by the IDA or IDG fields on an *AIRBAG_ALE card, the airbag would also be oriented.

- **Case 13718**

Performing 90 degree thin folds in the airbag folder could cause other folds in the airbag to go wrong.

- **Case 13637**

ENH_V and DPOP fields on the *AIRBAG_PARTICLE card could lose their values when adding new rows to the card by increasing NGAS, NORIF etc.

- **Case 13501**

A crash would occur following an attempt to sketch an airbag from the airbag editing panel.

- **Case 13470**

When using parameters with the *AIRBAG_REFERENCE_GEOMETRY card, opening up the parameter edit panel can lead to multiple error messages similar to:

```
Overflow in db_step_cbuff():
```

This will only occur if the keyword is over 1000 lines long.

- **Case 13378**

Previous versions of PRIMER would sometimes fail to write out some of the user-defined constants in *AIRBAG_SIMPLE_PRESSURE_VOLUME cards.

- **Case 12441**

PRIMER could occasionally crash when deleting entities in a model that contained airbag folding origami orients.

- **Case 10896**

Mesh independent airbag folding would not work if a local coordinate system was used for the origami.

- **Case 9992**

In the AIRBAG editing panel it is possible that a blank top row will be shown sometimes. This occurs only when the _ID suffix has been used and the airbag definition has been read from a file. This has been fixed for most cases, but the blank line may occasionally re-appear where the menu contents are large enough to require a vertical slider.
A related bug was that if you changed a field which modified the type of another field (SIDTYP for example), the dependent field was not updated correctly if the 'blank line' was present.

Case 9428

PRIMER could crash when remeshing a mesh-independent airbag after splitting a mesh if the user did not have any fixed points defined for the origami.

Assembly

- **Case 14452**

Model build process no longer unconditionally overwrites existing .lst file. User is given opportunity to abort the build and avoid loss of the file.

- **Case 14451**

The .lst file written from model build was not using the correct drive-mapped format (unix or PC) for the designate output operating system.

- **Case 13816**

“Model build from csv file” only worked when the full path was given for the impactor and model files. A relative filename can be specified and will be taken as relative to the path of the csv file itself.

- **Case 13784**

“Model build from database” in “Simple” mode now allows use of *INCLUDE and *INCLUDE_TRANSFORM definitions inside the component files themselves. This now works whether the Include file is defined by its relative path or by its absolute path.

- **Case 13540**

Directory drive-mapping has been fixed for model build. The process can be run on a PC with appropriate drive mapping. The directories on the csv file are configured in PC mode, i.e. x:\path. The output option for includes is set to Unix (so x: is resolved to /unix/path).

Belts

- **Case 14359**

When using PRIMER for belt fitting it is sometimes the case that a belt fitted to dummy A in a model also needs to be fitted to dummy B in the same model, in order to test behaviour with different dummies.

One way of doing this is to swap the include files so that a different dummy is read into the model, and to define the new dummy as 'structure' for belt fitting. After doing this, the belt could not be fitted – the belt was looking for elements of the previous dummy that no longer existed.

- **Case 14349**

Two problems arose with element seatbelt retractors and pre-tensioners.

1. The more recent pre-tensioner types 4 to 7 were not being drawn by Primer, and were therefore also not screen-pickable.
2. If a pretensioner referenced a retractor then this could 'lock' the retractor against deletion. Really such a pre-tensioner is a child of the retractor, and should be deleted when the retractor is deleted.

- **Case 14291**

If PRIMER had two or more models, and only one contained a seatbelt definition but this model's visibility had been turned off in Model > List, then the seatbelt fitter would still pre-select this model and belt definition meaning that the user might find himself working in an unexpected model.

The seatbelt fitter will not pre-select a belt definition from a model if that model's visibility has been turned off.

- **Case 13985**

In seatbelt auto-refit of a belt with mixed shells and 1d/2d seatbelt elements at a slipring, the auto-refit could sometimes swap round the number of seatbelt elements attached to the two belt segments either side of the retractor.

For example if the chest section had 5 belt elements at the hip slipring, and the pelvis section had 4, then refit would sometimes swap these around.

The number of belt elements next to a slipring in a 'mixed' belt section should now be preserved.

- **Case 13984**

The ability to select starting labels for belt remeshing in release 9.4 could trigger the 'new mesh will clash with existing' check if the user chose to recreate the belt using the same label range.

This occurred because the user was planning to delete the belt, but the clash checker did not know this!

The problem has been solved by moving the pre-meshing clash check so that it is only performed after any possible deletion of the existing mesh has occurred. Clashes that remain at that point are genuine and must be sorted out prior to meshing.

- **Case 13979**

“Find Attached” did not track across sliprings and retractors, making it appear (superficially) that the belt was not 'attached' to the structure on which these were located.

It could be argued that, in the strictly topological sense, the belt is not attached to the structure via these elements since it is free to move through them. However it is also counter-intuitive that a seatbelt is not attached to the vehicle, so the logic has been amended so that attachment tracks across sliprings and retractors.

This is the case both for 1d seatbelt elements, where attachment is via explicit definitions, and for 2d belts where it is indirect via shell sets.

A second problem was that the belt fitter was attaching the belt to the structure correctly via sliprings and retractors, but not at 'fixed' ends where the belt attached directly to vehicle structure.

If the original (base) belt path definition was specified via a node at its end then this will be used directly as part of the element topology at belt end points. In the case of shell or 2d seatbelt meshes with an odd number of rows this node will be used as an extra 'centre' node in the nodal rigid body that stabilises the end of the belt.

- **Case 13976**

When remeshing an existing seatbelt definition, either when only applying a new mesh or when going back to revise the base path and then remeshing, two problems arose:

3. Any retractors or sliprings in the original mesh were deleted and new ones created, meaning that any loadcurves, sensors, friction coefficients, etc. on the originals were lost.
4. The remesh panel always returned to its default mixture of element types, instead of presenting the user with the same mix of 1D belt, 2d belt and shell elements on each segment of the path.

These two problems have been solved. When a manual remesh of an existing belt definition is performed a (default) REUSE option has been added to the part of the operation where the original mesh is deleted prior to remeshing. If selected this reuses the original retractors and sliprings in the new mesh, moving them if necessary.

Also the existing belt mesh is scanned prior to a remesh, and the mixture of element types extracted and used as the default layout in the remesh panel.

- **Case 13824**

When using the auto-remesh function for seatbelts things could go wrong if the end (fixed) point of the belt was very close to the start point (retractor) end. The fitter would assume that the same retractor was at both ends, with bad results. This process has now been improved.

- **Case 13416**

In Release 9.3.x the seatbelt re-fitter did not handle cases where a stretch of shell belt connected directly to structure without intervening 1D seatbelt elements, typically at the connection between lap-belt and fixed mounting. It would tend to insert a stretch of 1D belt elements when 'auto refit' was used.

As part of the general seatbelt improvements in 9.4 this has been fixed, and the original belt definition should be copied more faithfully in such regions, replicating the direct connection of shells to structure via a nodal rigid body.

Checking

- **Case 14326**

Primer could give an incorrect warning regarding % of elements failed in a part if the shell internal angle checks were switched on.

- **Case 13977**

For rigid parts consisting of beam elements, and for beam or shell rigid parts subject to *CONSTRAINED_RIGID_BODIES where the master part consists of beam elements, LS-DYNA will add some extra nodal inertia to every node in the rigid part. PRIMER was failing to replicate this when calculating part inertia. PRIMER now replicates the LS-DYNA behaviour.

- **Case 13669**

A new error check has been added to report use of IDOF < 0 when Boundary Prescribed Motion is being applied to a rigid body.

- **Case 13639**

Primer wrongly reported an error for *DEFORMABLE_TO_RIGID in the case where the deformable part is meshed into the rigid part into which it will be merged on becoming rigid.

- **Case 13596**

Error checks performed on models containing *CONTROL_IMPLICIT_SOLUTION cards might have produced warnings about missing test functions.

- **Case 13581**

Thicknesses on *SECTION_SHELL can be input with T2=T3=T4=0 – LS-DYNA will set these equal to T1 by default. However, Primer reported this as a warning:

'Thickness T1 T2 T3 T4 are not the same'

This warning is no longer given for the case T2=T3=T4=0

- **Case 13441**

If a *BOUNDARY_PRESCRIBED_MOTION definition and an *INITIAL_VELOCITY definition were applied to the same rigid body, PRIMER9.3 unconditionally reported an error.
The logic has been improved so that no error will be reported for the case where the velocity at t=0 of the *BOUNDARY_PRESCRIBED_MOTION is the same as the Initial Velocity.
Further, a new warning has been added for the case where *BOUNDARY_PRESCRIBED_MOTION non-zero velocity is specified at t=0 and there is no *INITIAL_VELOCITY specified.

- **Case 13264**

When multiple *INITIAL_VELOCITY definitions are defined for same node PRIMER93 warned that different velocities were being applied, even if they had the same numerical value. The warning message has been changed.

- **Case 13197**

Some confusion that could arise with respect to the error configuration file when refreshing preferences.

The (statically stored) configuration data was not being cleared, meaning that old settings could 'hang around' unexpectedly. Also the error configuration file was being read repeatedly (system + user), possibly giving odd behaviour.

“Refresh pref” is now consistent with behaviour on start up.

- All settings are cleared
- pref files are read and we end up with one configuration file of interest (if system/user/cwd pref specify different files - the final one wins)
- this config file is then read and will control error configuration

- **Case 13155**

Use of *SET_GENERAL with options NODE/DNODE/ELEM/DELEM could produce incorrect results in PRIMER functions (e.g. checks) which require determination of whether or not the item is in a set.

- **Case 12882**

PRIMER was always giving an error message for a rotational spring with no orientation vector defined, but should only give this message if the nodes defining the spring are coincident.

- **Case 12679**

PRIMER's check function for constrained rigid bodies (when checking from the Create/Edit menu) can report incorrect errors if the part(s) PIDM and/or PIDS are changed. The check function has been disabled and the user is warned that check must be done after update.

- **Case 12515**

The error check tree now displays the number of errors/warnings per category without the need for the user to expand the row.

- **Case 12240**

LS-DYNA will not initialize if the inertia tensor of a rigid body is too small for accuracy. PRIMER now performs the same check.

Connections

- **Case 14373**

When a connection xml file was read into a model containing spotwelds with status BAD, on completion of read, PRIMER incorrectly included the pre-existing bad spotwelds in table of new welds that need to be fixed. The table now only displays any newly read connections which have failed.

- **Case 14089**

PRIMER could crash if opening the connection table with a model which contains connections in include files with filenames longer than 80 characters. A crash could also occur in the part table if displaying the 'Include' column with include files with names longer than 80 characters.

- **Case 14020**

When editing a connection layer on the part table using the 'more...' option, it is possible that when using multiple items in a layer that the 'Select' and 'Sketch' options invoked off the list popup would

be applied to the incorrect entry on the list. This would only occur if there were more than 5 entries in the list and the slider position for the list was not at the top.

- **Case 13544**

When weld contact is defined by node set, merging 2T and 3T welds sometimes produced a weld with a node missing from contact. This has been fixed by always using the 3T weld as the candidate.

- **Case 13218**

When PRIMER deletes a part, the default mode is to empty any connections attached to the part. The deletion of the FE entities of these connections is therefore compulsory; it should not be possible to block by selection of the “leave” option for the entity type. PRIMER 9.4 will delete the FE entities of these connections, irrespective of the “leave” option, if the “empty connections” option is set.

- **Case 12367**

The spotweld beam “Npanels” option on the Display->Colour panel did not work if the spotweld beams were not in a PRIMER connection entity. This has been modified so that if this option is turned on, connection entities are created for spotwelds in the model.

- **Case 12251**

The MIG weld functionality has been improved:

1) The weld proximity check is automatically suppressed upon creation.
2) When converting MIG welds to 'beamless' on the connection table, if one of the welds selected was BAD, none were remade.

- **Case 11643**

When re-making a connection (spotweld or adhesive) PRIMER by default will now re-use the original nodes thereby preserving nodal cross references, such as *DATABASE_HISTORY_NODE. The option to re-use old nodes can be disabled (options panel) to restore the old behaviour. Welds which are directly meshed to shell nodes will always be re-made with new nodes to make them mesh independent.

Constraints

- **Case 13395**

Changes made to the FRCMIN field in the *CONSTRAINED_LAGRANGE_IN_SOLID editing panel would result in erroneous changes to the FRIC field in previous versions of PRIMER.

Contacts

- **Case 13972**

It was possible to get a keyout message saying contacts with the _THERMAL_FRICTION option have been omitted - even though there are no such contacts in the model and the output version set is valid for that contact type.

- **Case 13553**

The logic used when calculating initial contact penetrations in PRIMER has been revised to be closer to that in LS-DYNA in cases where shell elements overlay solid faces, and also in cases where coincident shells are found.

Where shells overlay solids in a contact then LS-DYNA favours the shells for contact purposes, even if those shells have not been included explicitly in the contact definition (e.g. if the *CONTACT references a part set containing only the solids, LS-DYNA still uses the shells to determine contact thickness, stiffness, etc).

Where coincident shells are found LS-DYNA prefers the thinnest for contact purposes.

PRIMER now replicates this behaviour.
Note that PRIMER can still report different initial penetrations than LS-DYNA – possible reasons include:
LS-DYNA corrects penetrations (by moving nodes) in the order that they are found, often leading to different results when checking subsequent nodes/segments
SOFT=2 and IGNORE=1 prevent LS-DYNA from reporting any initial penetrations.

- **Case 12767**

PRIMER may give an incorrect error message if setting a SOFT value on optional card A of a _TIEBREAK contact.

Contour

- **Case 14292**

When *SECTION_SHELL specified elform=0, Primer was contouring this part as elform=2. This is not correct if the *CONTROL_SHELL option THEORY is otherwise set.

- **Case 13809**

'Discrete' contour bands were introduced in PRIMER 9.3 for some contourable data, in which a linear contour ramp was replaced with a series of 'discrete' values showing only the values actually present in the model.

There was an error in the display of these which meant that while the original contour plot would always be correct, subsequent blanking (or anything else which changed what was displayed) might generate a revised set of contour bands but the plot itself would not be updated to assign the new colours.

This would not always happen (it would depend upon the details of the change in the contour bands), and a workaround was to click on CT or SI which would redraw the plot correctly.

Blanking or other operations which change the contour bands of 'discretely contoured' plots will now redraw the model in the correct colours if this is required.

- **Case 13537**

The plotting of plastic strains within PRIMER could be slow in larger models. The speed of the plotting has been improved.

- **Case 13226**

A bug that would result in incorrect plotting of currently added mass in the 'Modify Assign Mass' panel.

- **Case 13180**

The colour of the 'Levels' sliders in all 'Contour Level Settings' panels have been changed from white to black.

- **Case 12278**

When data is contoured in PRIMER the SETTINGS panel gives various options for controlling what is seen, for example culling items below or above selected contour levels, or uncomputed or rigid items.

This worked correctly, but:

5. the ‘autoscale’ process then wrongly continued to consider entities that had been culled from a contour plot.

6. screen picking routines would allow picking of the culled items or treat them as obscuring genuinely visible items.

The internal visibility tables now consider the effects of items culled due to the various exclusions in contour settings. This means that both ‘autoscale’ and screen-picking should behave as expected, and process only those items which are genuinely visible.

Control

- **Case 13582**

The IMSCL field in the *CONTROL_TIMESTEP editing panel was being represented using two different text boxes - one for the flag (positive values) and for part sets (negative values). A single text box is now being used for this purpose.

Cut section

- **Case 13750**

If a *DATABASE_CROSS_SECTION has a title, that title now shows up in the Object Menu.

- **Case 13769**

When creating cross sections automatically by clicking on nodes, PRIMER will now 'unsketch' any cross sections or nodes no longer required. Previously, it could get quite confusing after multiple clicks as all the old sketches and node picks were still displayed on the screen.

- **Case 13767**

When typing a RADIUS value for a database cross section definition, PRIMER sketched the circle differently depending on what creation mode you are in ('P1 at centre' or 'P1 at origin'). The mode is irrelevant when a radius is set, as the circle is always centred at XCT, YCT, ZTC. The mode is now ignored when a radius is set.

Database

- **Case 14197**

When writing out DATABASE_HISTORY_###_ID with the default name of '<unnamed>' Dyna may complain about the '<unnamed>'. This has been modified to 'unnamed'.

- **Case 14042**

When creating database cross section entities off the edit panel PRIMER automatically populates certain fields based on the dimensions of the visible model. This allows the user to quickly create a cross section definition without having to calculate all the input first. However, it was possible to create a 'flat' cross section (LENL or LENM value set to zero) if the visible model was perfectly flat in one global axis.

- **Case 14022**

It was possible for PRIMER to sketch *DATABASE_TRACER entities at 0,0,0 rather than the actual coordinate.

- **Case 13794**

Fixed bug that would in some cases display '0' in fields and of the *DATABASE_FSI editing panel.

- **Case 13521**

PRIMER would crash when *DATABASE_CROSS_SECTION cards with titles were copied and then modified.

- **Case 13733**

Previous versions of PRIMER would wrongly warn about missing *DATABASE_BINARY_INTFOR cards if 'INTFORC' was turned on in *CONSTRAINED_LAGRANGE_IN_SOLID. PRIMER now correctly checks for the presence of *DATABASE_BINARY_FSIFOR instead.

- **Case 13198**

PRIMER could freeze and get stuck in a loop if using the *DATABASE_CROSS_SECTION edit panel and using AUTO_CREATE. The loop will occur if the user changes the creation method (say from 'Constant X' to 'Constant Y').

- **Case 13191**

A bug in the *DATABASE_CORSS_SECTION editing panel that would swap the 'Plane Type' back to CONSTANT_X when the AUTO_CREATE button was clicked.

Deleting

- **Case 13523**

If a model contained *LOAD_SEGMENT (or similar) and the elements on which the segments lay were deleted, then the loads could wrongly 'lock' the segments against deletion during a 'Cleanup' operation.

- **Case 13334**

When PRIMER has locked a load-curve against deletion, if one uses the '?' function to find out why deletion has not occurred, PRIMER would report multiple spurious cross-references.

- **Case 13320**

If a model contained *SET_XXX_GENERAL definition(s) which referred to part(s) via the entry PART or DPART and one or more of these parts was selected for deletion, PRIMER would incorrectly select the entire set and its contents for deletion.

Case 12693

In 'cleanup unused' there was a conflict between the 'empty sets/parts' actions which default to 'kill referring item', and the case where the user chooses explicitly not to let the referring item be killed by selecting 'LEAVE' for it.

In these situations the effective behaviour could be to leave the referring item, but to change the part or set references on it to zero, thus leaving an invalid definition. This would only tend to happen if the part/set was empty or latent.

Where an empty part/set is found on an item that has explicitly been selected to be exempt from cleanup, and the default 'delete referring item' action is in force:

+ The part/set reference on the referring item is not changed
+ Thus the part/set itself becomes locked against deletion

- **Case 9794**

When doing 'cleanup unused' and setting empty set action to 'Kill set, ref=0' if you had 2 (or more) things pointing to the same empty set the set would not get deleted. You would have to perform a cleanup unused operation a second time to delete the set.

Dummies

- **Case 14212**

When contact between dummy assemblies and structure was being used, and the same 'structure' part set was used for two or more assemblies, then an error message was produced claiming that the same part set had been used to define multiple assemblies.

This was wrong, and was due to mixing up part sets used to define assemblies (which must be unique) with part sets used to define vehicle structure contacted by assemblies (which can be the same).

- **Case 13666**

It is possible to save 'positions' in the Occupant positioning menu, but these did not include any overall translation or rotation of the dummy. The saved positions now record the complete dummy position including H-point coordinates and overall rotation.

- **Case 13425**

If ‘Occupant positioning’ is used in the following way, and all the below are true:

+ 'Drag assemblies' mode is used.
+ The right mouse button is used to drag this assembly + parent only (right-mouse)
+ The parent assembly is given restraints
+ The parent assembly is itself a child of another assembly

Then there will be a tendency for the joint that 'owns' the parent assembly (the one above the one being dragged) to come apart.

This occurred only in the particular set of circumstances above. In particular, dragging with left and mid mouse buttons in this context worked correctly.

- **Case 12508**

If you work interactively (with graphics) and use the command line /DUMMY POINT POSITION command before using the menu interface OCCUPANT DUMMY command a crash can occur.

- **Case 12311**

Keyword with 'free standing' PGP encrypted data (especially dummy models) could crash PRIMER since it didn't know how to handle them.

This has been fixed in release 9.4 as follows:

Free-standing PGP encrypted blocks, which means those not understood to be part of a CURVE, TABLE or MATerial keyword, are copied verbatim to a temporary file on input.

On output these blocks are written back out to the file immediately before *END.

This solution works so long as the encrypted blocks are genuinely free-standing, meaning that their location within the input deck is not important.

If these blocks are not free-standing (i.e. part of an unexpected keyword is encrypted), or they rely on a previous *Keyword header to give them a context, then this strategy will fail, and PRIMER 9.4 will not be able to read the model. For the time being, such input deck assembly practice is deprecated.

- **Case 10818**

When beams in assembly A of a dummy or mechanism model have orientation ('3rd') nodes in assembly B the positioner will - correctly - flag this as an error, since it infringes the rule that nodes should not be in two or more assemblies.

However it is sometimes the case that beam orientation nodes are not relevant, for example because the beam section is circular and the 3rd node has been chosen arbitrarily and does not matter.

To deal with these situations an 'IGNORE_B3' option has been added as an option following the pre-positioning check. If chosen this will suppress the propagation of assembly movement to beam

3rd nodes which both stops the warning message and also stops motion in assembly A distorting a 3rd node in assembly B.

This is not a programme-wide flag, rather it is cached on the Dummy or Mechanism definition itself, and its value persists only for positioning of that Dummy/Mechanism within the current PRIMER session.

Elements

- **Case 14006**

The PSID input button on the ELEMENT_TRIM edit panel did not work.

- **Case 13996**

The 'Undo last' button on the SPH element edit panel did not work correctly.

- **Case 12636**

*CONSTRAINED_JOINT_STIFFNESS provides stiffness between two 'rigid bodies' PIDA and PIDB which can actually be rigid parts or nodal rigid bodies.

Historically PRIMER would always consider that these were PART definitions, but this has now been extended to permit them to be either PART or Nodal RBs

- **Case 12553**

The ELEMENT_SOLID_ORTHO editor would generate an error if users attempted to input negative components for 'a' and 'd' vectors.

FMH

- **Case 14207**

Erroneously, the vertical angle of a FMH may be set to the maximum horizontal angle during a position process if the horizontal angle is larger than the maximum horizontal angle set.

- **Case 13791**

In the FMH targeting panel, if adding or subtracting new target points, the status of the ON/OFF write toggle buttons was lost (they all reverted to ON).

- **Case 13568**

A crash could occur when aborting from a shell set edit panel when creating a shell set for the ‘auto-vertical tool’ on the FMH panel.

Graphics

- **Case 14099**

The vector for *Boundary_prescribed_motion was incorrectly being plotted in global co-ordinate system, irrespective of the presence of CID on the vector card.

- **Case 13940**

Graphical display of *DEFINE_VECTOR definitions had some errors:

7. If they had a coordinate system defined then the vector was oriented correctly, but its location was at global coordinate rather than in a local one, i.e. it did not take into account any offset of the coordinate system origin in global space.
8. The front/back clipping plane calculation required for display on 3D hardware was not taking into account the length of the arrow used for the vector, with the result that it could sometimes get clipped out as the model was rotated.

9. The clipping plane calculation was also not updating correctly as vectors were created or edited, with the result that a new vector far from the existing model centre (or one moved to such a location) might also be clipped out and not displayed correctly.

In the typical case of vectors being located within the bounds of the model 'structure' these problems would not have been evident, they would only show up when vectors were some distance away.)

- **Case 13753**

In the ENTITY panel it is possible (under Options) to specify whether or not beam 3rd nodes are 'attached' or 'unattached' for the purposes of graphical display.

The unattached case (the default) worked correctly, but if 3rd nodes were then made attached they were not drawn at all - regardless of the display of attached or unattached node display switches.

- **Case 13415**

The display of 'unattached' nodes could show nodes that were in fact attached if:

- They were part of a nodal rigid body or extra nodes on a rigid body

AND

- These *CONSTRAINED definitions appeared in the input deck before some 'structural' items (e.g. elements) to which the nodes were attached.

A related problem was the 'options' for attachment via constrained items as defined in the ‘Entity’ panel would only be considered if that panel were opened interactively, since this was required to initialise its settings.

- **Case 13237**

If the 'Only' or 'Unblank' graphics options are used within the Keyword Editor for 'owner' types Part, Material, Hourglass, Section, Equation of State or Thermal Material then strange graphics behaviour could arise. Duplicate, unwanted graphics were added to the display, which can obscure what is actually required, and in some cases it will also cause strange colours to appear as items are drawn twice.

- **Case 13169**

When using 'HI'(dden line) mode graphics it was - rarely - possible for a few items to appear faintly shaded and lit in grey, rather than just 'hidden'.

This error was confined to the rendering of element sets and part sets, and possibly other items drawn in terms of 2D or 3D elements, due to the way their 'hidden fill' was being computed. Normal display of 2D and 3D elements was unaffected.

- **Case 12927**

There was a 'slow file selector' problem on some Linux platforms. Typically the first time a file selector was used it would appear instantly, but the 2nd or 3rd time would have a delay of several seconds.

File/directory selection popups should now always be 'quick' on all Linux platforms.

- **Case 12648**

If shells were deleted from a part and free edge display was active, then the free edges in the graphics would not get updated to show the new edges where elements had been removed.

Where deleting shells leaves topological free edges then these will now be displayed correctly.

- **Case 12539**

In release 9.3 the drawing of very short beams (eg discrete types) was changed so that if their screen length was less than some number of screen space units then the symbol changed to a blob.

The threshold size was set to 10, and the blob diameter to 5, but these values were really too small since they translated to 2 and 1 pixels respectively on a smaller display. Therefore they have been increased to 25 and 15.

In addition when these values were changed the graphics cache for beams was not marked as being out of date, resulting in the symbols not responding to a size change unless either the image scale was changed or the plot completely redrawn.

- **Case 12505**

When 'rubber-band' drawing operations such as 'zoom' took place against grey window backgrounds the rubber-band lines were (depending upon the exact shade of grey) sometimes not visible. Exactly 50% grey would be the worst offender in this respect.

The colour used for rubber-band operations has been changed so that these lines show up even if the background colour is medium coloured (typically grey).

- **Case 10839**

When elements were moved from one partially blanked part to another (using PART, ADD_ITEMS) problems could occur with the graphics following the part re-parenting operation with confusion arising about blanking, visibility and pickability.

- **Case 10837**

When a part-based element was moved from one part to another it would acquire the colour of its new part, but not necessarily its other visual attributes, notably any transparency.

When elements are moved to a new part they will now inherit all the visual attributes of the new part.

IPP

- **Case 14130**

A change has been made to avoid a possible PRIMER crash when the 'keyout' function is used on the IPP targeting panel.

Image

- **Case 14178**

For the postscript/pdf write panel, the text box that displays the filename to which you are writing did not update when you selected to overwrite an existing file.

Include

- **Case 14227**

A ‘model build’ operation, in previous versions of PRIMER, followed by a change to a *PARAMETER card used by one or more master files might have resulted in the impactor getting repositioned.

- **Case 13914**

The selected include file on the load curve edit panel could be wrongly reset to the current layer when carrying out certain operations on the panel, such as importing a curve.

Include transform

- **Case 13726**

PRIMER would corrupt inertia tensors for *PART_INERTIA cards inside *INCLUDE_TRANSFORM if the part (or include) was oriented (rotated or scaled) and then the include was written back out.

- **Case 13469**

Points used in *DEFINE_TRANSFORMATION are handled internally in PRIMER as real numbers. These are now written out (as expected by LS-DYNA) as integers.

- **Case 13426**

PRIMER could crash if reading in a mixture of _ID and non _ID *CONTACTs if the non _ID contacts were in *INCLUDE_TRANSFORMS.

- **Case 13274**

*NODE_TRANSFORM cards used inside *INCLUDE_TRANSFORM include files were not oriented correctly.

- **Case 4859**

LS-DYNA rotates boxes used in *INCLUDE_TRANSFORM's by rotating the vertices. This may change the shape and volume of the box. PRIMER94 has been fixed to perform the same rotation when reading INCLUDE_TRANSFORM's, so that the correct contents of the box are reported in the transformed model.

The rotation of a box during explicit orient uses a more robust algorithm which may increase the size of the box or resize it to ensure no contents are lost.

Installation

- **Case 13475**

In version 9.3 and 9.3.1 the following misleading error message would be generated from the 64 bit versions of D3PLOT, T/HIS and PRIMER on UNIX and LINUX if there was a FLEXlm licensing error.

==========
The version of flcheck93.exe being used is incompatible with the final 9.3 release. Please replace flcheck93.exe with the one included with this software release.
==========

From version 9.4 onwards the standard FLEXlm error message will now be displayed.

Keyword

- **Case 14259**

_OPTION2 for keyword *INTERFACE_SPRINGBACK_ can now be <none> in the keyword editor.

- **Case 14250**

The KEYWORDS->DATABASE_PWP_FLOW button now invokes the correct generic keyword editing panel instead of the empty *DATABASE_CROSS_SECTION object menu.

The SKETCH_ALL button in the *DATABASE_PWP_FLOW keyword editor has been disabled as the button is currently not functional.

- **Case 14228**

Parameter ADPOPT in the *PART editing panel can now be a loadcurve when defined with a negative value.

- **Case 14196**

In the *HOURGLASS editing panel, parameters QB and QW are no longer modified when QM is modified. PRIMER previously did modify these fields erroneously.

- **Case 14032**

The 'K' field on *INTEGRATION_BEAM would be lost if performing a copy operation on this card (or updating the card on an edit panel).

- **Case 13974**

The internal label for *PERTURBATION could get set to 0 if modifying this card within PRIMER. This would prevent the user from picking the keyword in an object menu.

- **Case 13760**

If an include file could not be found when reading a keyword file the error message was confusing and gave the wrong line number.

- **Case 13723**

It was possible for the green input buttons on the *SET_NODE_ADD_ADVANCED View/Edit panel to disappear if the visible 7 rows of data were full.

- **Case 13711**

PRIMER now permits specification of a load curve using the IREFLG field in *CONTROL_ADAPTIVE. This is in accordance with the way this field is handled in LS-DYNA 971.

- **Case 13463**

*INTEGRATION cards were not being offset when included by *INCLUDE_TRANSFORM. They should be offset by IDPOFF.

- **Case 13345**

For the *EQUATION_OF_STATE edit panel, if you changed the numbering method, the 'CREATE' button was un-greyed, even if you hadn't chosen a 'type'.

- **Case 13269**

When creating/modifying a *SET_..._GENERATE you can now press create/update when in 'view/edit' mode if you have valid start and end ranges.

- **Case 12671**

In Keyword->Control->Modify, if you clicked in any of the 'Project', 'Number' or 'Stage' boxes, but didn't actually type anything in, they would still become active and _ID would be added to *KEYWORD.

- **Case 12487**

The BETA field in the *ELEMENT_SHELL_BETA editor was being labelled as PSI (LSDYNA 970 terminology) in earlier versions of PRIMER. Negative BETA values are now permitted as well.

Kwd editor

- **Case 14320**

Primer could give warning message or even crash after attempting to use the 'create' or 'edit' button on the pop-up that can be provoked off the 'Create' or card number button on a keyword edit panel.

- **Case 14090**

In the generic keyword editor it is possible to select a range of rows using the mechanism [Click on a row A] [Shift + click on row B] which will cause all rows in the range A to B inclusive to be selected.

This worked correctly, however if a 'Filter by' option had been used to limit display to only those rows with certain sub-keywords then the process above would select those rows if they lay in the range A to B even if they were not currently being displayed.

This is best explained by an example. Consider a model with three shells 1 to 3, in which shells 1 and 3 have the _OFFSET sub-keyword. Thus the keyword editor will by default show all three rows:

Row 1: ELEMENT_SHELL_OFFSET
Row 2: ELEMENT_SHELL
Row 3: ELEMENT_SHELL_OFFSET

If the user chooses only to show those elements with an _OFFSET suffix then the keyword editor will now show:

Row 1: ELEMENT_SHELL_OFFSET
Row 3: ELEMENT_SHELL_OFFSET

Previously if the user clicked on row 1, followed by shift+click on row 3 then row 2 (not currently visible) would also be selected.

Now when a [click ... shift click] range is used only those rows that are actually visible, as determined by any sub-keyword filter settings, will be selected.

- **Case 13787**

When a data field was 'integer value if positive, but loadcurve if negative' then the minus sign of the loadcurve could be lost if the field were edited via a daisy-chain popup menu from an editing panel or the keyword editor.

When editing an existing curve (or table or function) specified by a negative value in a data field then this will be 'remembered' across an edit.

- **Case 13555**

The keyword editor 'SEL_ALL' option, meaning 'Select all of this type' for some operation, was selecting all possible items of the given type and not restricting its range only to the subset of keywords selected for display.

'all' in the context of the keyword editor (for selection, sketching, checking, etc) is now limited to the subset of keywords selected by the user (i.e. eligible for display).

In the context of the keyword editor being used to show the output of some other operation, for example ‘Model Check’, and hence being limited to the items selected externally for inclusion, 'all' is now limited in scope only to those items.

In summary the meaning of all in this context means 'all items eligible for display in the editor' given the current settings. This includes rows that have been hidden by the user since they are still eligible for display.

- **Case 12909**

In V9.3 the keyword editor for *PART would handle incorrectly any *MAT, *SECTION, *HOURGLASS or *MAT_THERMAL fields that used character labels instead of numeric ones.

They would be shown as negative numbers (the internal PRIMER representation of these labels) on a red background, treated as syntax errors, and be un-editable as characters.

(Normal, +ve, numeric labels for any of these fields would work correctly.)

These labels will now display correctly as characters if this method has been used.

- **Case 12714**

The 'Check' button in the main *LOAD_BODY menu is now functional. Previously it could be inactive (greyed out).

Loadcurves

- **Case 14281**

*DEFINE_CURVE definitions which are referenced by *DEFINE_TABLE's did not have axis units - even if the table did.

- **Case 13387**

The 'specify curve number' buttons should not be shown on the panel used to export curve data from a *DEFINE_CURVE edit panel. The buttons have been removed.

- **Case 12374**

The loadcurve edit panel was not remapping buttons correctly when in IMPORT or EXPORT mode and you clicked on certain buttons along the top (‘autoscale’ for example).

Local axes

- **Case 13932**

Previous versions of PRIMER would, in certain rare cases, compute local element directions incorrectly if *ELEMENT_SHELL_BETA were invoked in conjunction with *PART_COMPOSITE.

- **Case 11116**

Triads, if turned on, would not be displayed on beam elements defined using the ORIENTATION option.

- **Case 8237**

Element triads now account for local material angle specifications. Local angles, as specified using *MAT, *ELEMENT, *SECTION, *PART_COMPOSITE and *INTEGRATION cards, are respected.

Mass

- **Case 14134**

The mass displayed on the part table has been adjusted to give better agreement with LS-DYNA. When part mass, lumped mass (on deformable) and NRB mass are displayed for all parts, the total should be the same as the model mass.

- **Case 14107**

*ELEMENT_MASS_PART has been corrected to allow additive definition for ADMASS case which use SET_PART, as LS-DYNA allows this.

- **Case 13929**

If DT is set on the material type 100 card for solid spotwelds, LS-DYNA adds mass in two separate calculations. One is reported as “spotweld added mass”; further mass may be added as part of the normally-reported “added mass”. In PRIMER (contouring, part table, etc) we now include all added mass from both calculations in the report and %added mass is the ratio of this to the original (density as specified) part or model mass.

- **Case 13584**

Mass calculation for MAT_CABLE beams has been corrected to ignore VOL on the section card and use the value CA for volume and consequently mass calculation.

- **Case 12459**

PRIMER now computes beam structural mass values from *INTEGRATION_BEAM cards when the beam section refers to an integration rule.

Materials

- **Case 13793**

Check for zero density is now omitted for *MAT_ALE_VACUUM.

- **Case 13628**

*MAT_NON_LOCAL is now handled outside the material edit panel. This is because it applies to parts, not materials.

- **Case 13367**

The description in the 'EDIT ITEM' box for field SHRMAX in MAT_169 was incorrect.

- **Case 13352**

MAT_172: PRIMER would incorrectly write out AOPT related parameters when AOPT was 0.0. As a consequence, it would also incorrectly expect these cards to be present in the input deck while reading in this material data.

- **Case 12704**

The documentation for material #196 (General Spring Discrete Beam) does not make it clear whether loadcurve FLCID is absolute force vs deflection, or a factor on this. Similarly references to moment vs rotation for DOF codes 4, 5 and 6 is patchy.

The treatment of units for this material in PRIMER assumed that the initial documentation was correct (which may change), and it also did not distinguish between force/deflection for DOF = 1/2/3 and moment/ rotation for DOF = 4/5/6, incorrectly using Force and Deflection units for all degrees of freedom.

The units have now been separated so that translational degrees of freedom are assigned force, deflection; and the rotational DoFs have moment, rotation. The editing panel for this material has also been corrected so that changing the degree of freedom on a row will update the units of its associated data immediately.

However we are still awaiting clarification about the true meaning of the loadcurves on this card; we may need to change PRIMER's assumptions about units again in future.

- **Case 12527**

If creating or modifying a material, and then using 'Import' on the edit panel to import a material from a material database, if a material title is already defined, PRIMER would not use the title from the imported material card. A switch has been added to allow the user to always use the title contained on the imported material.

- **Case 12242**

The timestep of some materials (e.g. MAT57) depends on the gradient of the steepest segment of a stress-strain load-curve. LS-Dyna discretises such curves into 100 (or LCINT) points, which may affect the maximum gradient of the curve and hence the timestep. PRIMER has now been corrected to use the discretized version of the curve.

Mechanism

- **Case 12281**

When mechanism or dummy assemblies are wholly contained inside include files subject to *DEFINE_TRANSFORMATION, then positioning the mechanism/dummy would cause the *DEFINE_TRANSFORMATION to be modified accordingly.

However the syntax of the *DEFINE_TRANSFORMATION card means that a rotation of zero degrees through coordinate (0,0,0) would be interpreted differently, and there was a small - but finite - chance that such a rotation entry would fall foul of this.

This has been fixed by testing for this situation and substituting a rotation of zero degrees through coordinate (1,1,1). This will not actually do anything, but it will preserve the 'placeholder' row in the transformations required to store any future (finite) rotations due to subsequent positioning.

Menus

- **Case 14065**

In the *AIRBAG, *EQUATION_OF_STATE, *MAT and *MAT_THERMAL editing panels (which all share common internal logic), strange behaviour could arise if:
The card was very complex, with more than 8 rows of data, causing a local slider to be mapped.
And the user reduced the vertical height of the panel sufficiently to require a menu panel slider to scroll its contents.
Then a click on the local slider could cause the panel to go grey momentarily, then jump back to a maximised size. It would still work, but the process was slightly alarming.

- **Case 13181**

Option 'Postscript file' in the 'Images' menu has been renamed to 'Postscript/PDF'.

- **Case 12905**

The logic to automatically open an edit panel when clicking on 'Modify' and only one entity exists in the model has been modified. Now the panel will only open automatically if the appropriate model is active in the model list.

Merge

- **Case 13912**

When doing a node merge operation, if one (or more) of the nodes were used in a connection, the connection would not be updated properly during the merge and could get corrupted.

- **Case 13724**

When merging items which can have an optional _ID (e.g. *CONTACT) PRIMER could unreasonably refuse to perform the merge if there was a clash of labels, but one (or both) items did not have the _ID option set.

- **Case 13697**

If you did a model merge with the node merge option ticked, then when the node merge panel was mapped and you switched to cleanup or delete and then back to node merge the data was lost but the apply button was left active.
The remove panel has now been changed so that if you go directly into node merge (by either ticking the node merge option on model merge or by Node->Merge) the Cleanup and Delete buttons are greyed out to prevent this.

- **Case 13657**

If a model contained include files that were not read (from a model scan) and it was merged with another model the new merged model would forget that the include files had not been read.

- **Case 13629**

PRIMER could crash if merging models failed.

- **Case 13275**

If model merge would create out-of-range labels (e.g. 9 digit shell labels) a warning is now given and the user is given the option of aborting, ignoring, automatically renumbering, or mapping the renumber panel after merging.

- **Case 12649**

If copying a model (e.g. using Model->copy or Model->merge), master-file information such as numbering ranges could be lost if the model did not contain include files. Also, model merge options have been added to allow the user to select which information to keep (such as numbering ranges).

Mesh

- **Case 14118**

PRIMER could incorrectly try to fix an element transition when using the 'fix transition' tool if an element that did not need fixing was picked.

- **Case 13513**

Combining shells (from the Mesh/Split menu) could sometimes produce a shell with a strange shape. Additionally, only 4 shells at a time could be combined. This limit has been removed.

- **Case 13316**

When offsetting shell elements using the Mesh->offset feature, the offset vector of nodes was determined by one shell, rather than taking the average of all the shells that reference the node and are selected for offset.

- **Case 12555**

When doing shell splitting in ‘line’ mode the user could not pick the shell to split if it was very large on the screen.

- **Case 6125**

Element splitting has been made significantly faster. In previous versions, this operation could be very slow when applied to large numbers of elements.

Model build

- **Case 14366**

When using “Model build from CSV file”, typing the names of a model and impactor in the appropriate boxes and then clicking on 'Make' would sometimes provoke a crash in previous versions of PRIMER.

Model modified

- **Case 14279**

Model modified could report that fields have changed on *CONTROL cards that do not have any fields (for example *CONTROL_MPP_IO_NODUMP).

- **Case 12921**

Model modified had several problems with parameters:
They were referred to by internal label rather than name.
If a parameter was deleted, model modified thought that all parameters had changed.
Model modified did not detect if a *PARAMETER_EXPRESSION was modified.

- **Case 12920**

Model modified did not work correctly if a connection was deleted (it would say that all connections have changed instead of just one).

- **Case 8307**

The user can now set the number of significant figures for checking floating point numbers when carrying out a 'Model modified' operation.

- **Case 6697**

Model-modified provides a powerful method for detecting changes in models in PRIMER. It is not, however, suitable for models that have been built using the model build (Database/Template) process.

For these cases, a sister function 'compare to disk' has been developed which will detect changes in any include file by comparing with the original component include file on disk. Any items detected in the master file will be reported as created, as the build process normally produces a clean master file. To give sensible comparison of real numbers, such as coordinates which get manipulated by include_transform, the preference 'threhold_for_modified_floats' should be set appropriately.

- **Case 5750**

Two unnecessary redraws have been removed when a model is checked for modification.

Multiple selection

- **Case 13230**

If a user had added (using 'Add items' and screen-picked or selection from a menu) a set to a *SET_NODE_ADD_ADVANCED that was not a node set, then subsequent attempts to add a *SET_NODE would fail (however, there was no problem with adding a node set from the 'Edit' section of the set editing panel).

Nastran

- **Case 14143**

A bug in the NASTRAN output translator which would renumber the labels of NASTRAN CONM2 cards resulting from *ELEMENT_INERTIA cards.

- **Case 13815**

NASTRAN beam offset vectors are now read in and written out by PRIMER's NASTRAN input translator and output translator. Previously the offsets could be lost.

- **Case 13705**

When reading in NASTRAN decks with shell elements defined with beta angles, if there is no optional second line it was possible that the optional nodal thickness values on the DYNA element card could be populated with random numbers. This only affects certain hardware types.

- **Case 13535**

A bug in the NASTRAN output translator that would occasionally repeat the last material in the output PCOMP cards.

Nodal Rigid Bodies

- **Case 13158**

*PART always has a label (ID). *CONSTRAINED_NODAL_RIGID_BODY may optionally have a label (ID). LS-DYNA treats nodal RBs as very similar to Parts; there are several places in the keyword input deck where the manual indicates a Part ID, but it is possible to input a NRB ID. PRIMER handles these occurrences (where known) as well as it can.
However, LS-DYNA does not prevent the case of a NRB with the same ID as a *PART. If the input data refers to an ID that belongs to both a Part and an NRB, LS-DYNA will prefer the Part over the Nodal RB, so PRIMER does the same.

Also, a *SET_PART definition can contain both parts and nodal RBs, and this can be utilised in several contexts (for example to define a BODY_LOAD on a set of parts ... or nodal rigid bodies). Therefore PRIMER will now accept nodal rigid bodies in *SET_PART definitions.

It is *strongly* recommended that users do not allow their Part and Nodal Rigid Body labels to overlap since the results are not easily predictable!

Orient

- **Case 14082**

When scale orient operation is used to perform a reflection (i.e. scx*scy*scz < 0) the topologies of elements should be reversed. This is necessary to prevent solids from inverting.

- **Case 14023**

If applying an 'undo' after an orient scale using 'drag' the model data could be corrupted.

- **Case 13702**

Orient (and units) when applied to LOAD_NODE were found to alter the coordinates of the force follower nodes M1 M2 M3. This has been prevented.

- **Case 13522**

By default the option 'elems in new part' is active for copy-orient. Copy-orient of Database cross-section which uses PSID, was incorrectly copying the part-set and its parts, resulting in an empty cross-section definition. Now, parts will only be copied when they belong to elements which are being copied.

- **Case 12828**

Logic for re-sizing boxes after orientation has been improved so that:
Only the nett rotation is considered and
Changes in the nominal nodal contents of the box are determined and reported.

- **Case 12793**

When reflecting *INITIAL_VELOCITY_XXX with angular rotation terms, PRIMER was failing to change the sign of the angular velocity, resulting in a reflected wheel spinning backwards.

- **Case 12721**

Translations on *PART_MOVE cards are now applied to the part when a model is read.

Parameter

- **Case 14112**

When the mouse is hovered over a text field in an editing panel which contains a parameter then the parameter name and value are shown.

If the parameter is preceded by a minus sign, i.e. '-&xxx', then the popup warns that the -ve parameter value is being used.

There was an error in the diagnosis of -ve parameter usage which meant that if a parameterised field contained a minus sign anywhere then this warning was mapped. This could happen while a parameter was being replaced by an explicit value, even if the minus sign was in the exponent (eg 1.0e-3 would trigger this message).

- **Case 14033**

PRIMER could crash if creating a parameter in a newly created empty model if you had tried (and failed) to read in a model containing improperly formatted data.

- **Case 13959**

When a *DEFINE_TABLE definition was followed by loadcurves that had labels defined by parameters, the table might 'lose' the loadcurves if the parameter definitions occurred after they were first used.

- **Case 13835**

If a parameter was used for the ID of a contact surface, it was lost following an edit.

- **Case 13478**

In PRIMER 9.3(.1) an attempt to create a new floating point parameter in an integer field generates an error message and is rejected in an ordinary editing panel. However the same attempt in the keyword editor generates many such error messages and eventually crashes due to a stack overflow.

The crash has been stopped, and in 9.4 this has been extended so that a floating parameter that is in fact a whole number (eg 1.0) is accepted in an integer field, albeit with a warning message. However a fractional parameter (the test for a fraction being 1 part in 1e6) is still rejected.

Part table

- **Case 14073**

PRIMER could crash if attempting to change the label of a part in an edit panel invoked off a part table containing only one part. It is not advised to change the part label through the part table, so the user is now prevented from doing so.

- **Case 13992**

When part table is written in csv format, any character strings (such as part title) which contain commas are now enclosed in double quotes (').

- **Case 13607**

Entry of new material id on table creates a copy of the old one to the new label. If the old one did not exist, PRIMER was creating a new installed item with undefined data. However, in this case, the correct behaviour is to create a new latent one which will not be keyed out.

- **Case 13385**

PRIMER could crash (may be more likely on 64bit machines) if using a pop-up on the edit panel to modify part COLOUR or STYLE.

- **Case 13287**

A bug in the part table meant that when resorting the table contents and then changing an item, the updates may not be applied correctly.

Part tree

- **Case 14136**

Reading a NASTRAN or RADIOSS model now automatically updates the part tree.

- **Case 13453**

PRIMER could crash if the part tree 'Find' feature is left on when deleting and reading files.

Penetrations

- **Case 14131**

The penetration check function that generates null beams on crossed edges has been prevented from making beams of length less than 1e-6.

- **Case 13834**

In a model which contained a contact tying beams to solids and was highly aligned with global coordinates, PRIMER was found to incorrectly report many cases of untied nodes on the beams. The logic for tied contacts has been corrected to account for the case where neither slave nor master segment has any thickness.

- **Case 13762**

When contact penetration checking, PRIMER could report spurious penetrations if the slave side of the contact was defined by Part or Set_Part, and the master side was defined by Set_Segment.

The error arose because the master side segments were (wrongly) being included in the slave side for checking, giving in effect a check that combined the true contact definition with a 'single surface' check based on the master side segments.

- **Case 13486**

PRIMER 9.3.1 could report spurious penetrations of large values in solid-solid contacts, where the faces of slightly distorted solids are on the point of contact (interference fit). The escape vector plotted showed that PRIMER was checking the node against the incorrect face of the solid.

- **Case 12390**

When plotting contact penetrations, dynamic zoom was unnecessarily slow.
A speed-up has been achieved in contact penetration when many near coincident elements occupy a small volume of a larger contact space.

Finally, contour bars (of all contour plots, not just contacts) were not being redrawn correctly if the window size changed, remaining instead at their original 2D window space coordinates, which could lead to their disappearing off the top of the screen.

Quick pick

- **Case 12810**

Historically PRIMER has regarded shell and solid elements as 'opaque' for picking purposes if the plotting mode includes hidden surface removal, that is HIdden line or SHaded modes.

However it is possible for the user to perform 'mixed mode' plotting in which parts or elements may be rendered in wireframe mode even if the current display mode is Hidden/Shaded, and users have complained that they are unable to pick nodes 'through' such wireframe components even though the nodes are visible on the screen.

Therefore picking has been modified so that if a shell/solid part is rendered in wireframe mode then:

- If picking is for some other type of item (typically, but not limited to, nodes) then these will be pickable 'through' the wireframe component if they are visible.

- However if picking is for a 2d/3d item (solid, shell, part, etc) which might include the wireframe item itself then it is treated as opaque.

The latter condition makes ergonomic sense since if an image contains two parts, one wireframe 'on top' and one shaded 'underneath', then if alternative logic is not applied the 'underneath' part will be picked in preference to the 'on top' one, which is counter-intuitive.

Read

- **Case 14427**

When character labels were used for materials (or sections or hourglass definitions) an internal mix-up could occur if more than 100 such labels were used.

The result would be that the first part to reference such a material (or hourglass etc) could sometimes end up referring to the wrong material. The second and subsequent parts would be OK.

- **Case 14386**

If the include file specified after a *INCLUDE_TRANSFORM line was not found on disk PRIMER would look at the following lines, treating them as filenames, when in fact they would be numerical transformation data.

While this didn't cause a problem it generated spurious error messages during the model read phase.

If the include file in an *INCLUDE_TRANSFORM definition cannot be read it now skips to the next *keyword.

- **Case 14251**

Experience shows that LS-DYNA will accept _LIST as an option on the *DATABASE_HISTORY card, even though this is not among the permitted keywords. Users sometimes add this, possibly because of the similarity between this and the *SET_xxx keyword.

PRIMER will now accept _LIST among the sub-keywords on this line, ignoring it silently.

- **Case 13631**

When *SET_xxx_GENERAL was encountered PRIMER expected the 'OPTION' field to be in upper case (eg 'BOX', not 'box') as shown in the user manual.

However it transpires that LS-DYNA will accept lower case input in these fields, so PRIMER has been modified to be case-insensitive in this context.

- **Case 13480**

PRIMER could incorrectly populate the 2nd and/or 3rd field of the optional card for *KEYWORD_ID with junk if only the first or second field are specified.

- **Case 12883**

*INITIAL_AXIAL_FORCE_BEAM incorrectly had a label field within PRIMER. This has been removed.

- **Case 12830**

PRIMER could introduce a blank field in error if reading comma separated keyword data which also had trailing spaces in a field after the data. For example (white space after the label but before the comma in the label field):

```
*SECTION_BEAM
1 ,1, ,5,1
1.9,1.9,1.7600002,1.7600002
```

- **Case 12758**

If using NRB's without specifying a node set explicitly (allowed in DYNA, node set is assumed to be the same label as the NRB), and this NRB label clashes with another NRB in the model, it is possible when reading the model into PRIMER, to lose the connection between the NRB and the

node set. This only occurs if the second NRB read in is the one where the node set is not defined explicitly.

- **Case 12725**

PRIMER would not read DATABASE_HISTORY_NODE_ID where the title contained commas.

Renumber

- **Case 13576**

PRIMER now has a new preference 'edit_panel_renumbering_rule' (default is layer highest + 1) which pre-configures numbering method for new entities in edit/keyword panels.

- **Case 13571**

The include range renumber option on the include tree panel could give a message saying items were out of range when they weren't.

- **Case 13543**

PRIMER now warns on update from edit/keyword panel if the label for the new item lies out of range defined for include files.

- **Case 12879**

When ELEMENT_SPH cards are renumbered, the associated node labels are now renumbered as well.

Scripting

- **Case 14322**

When adding and removing items to/from a *SET_PART, PRIMER could sometimes add/remove Nodal Rigid Bodies that had not been selected.

This occurred because LS-DYNA now accepts both PARTs and Nodal Rigid Bodies in part sets, and while PRIMER had been modified to comply with this some of the internal logic still assumed that only parts would be processed, meaning that Nodal Rigid Bodies previously selected for processing in unrelated operations might be included in this operation by mistake.

- **Case 13783**

The Model.PropagateFlag() function did not propagate flagging from materials to loadcurves.

- **Case 13782**

The KeywordCards() function did not work correctly (newline characters were omitted) for cards with multiple lines of data.

- **Case 13600**

When the Javascript 'DialogueInput' function was used to issue command line strings various problems could arise if the commands were badly formed or incomplete.

Typically this would arise if the command being parsed expected a filename, and the symptoms would be a never-ending series of error messages or - possibly - getting stuck in a 'help text + repeat command' cycle.

Handling of errors within Javascript command sequences is now more robustly handled. The command will still fail, but it should do so in a more controlled fashion and the 'endless loop' problem should no longer arise.

- **Case 12575**

Long lines of text (> 120 characters) could get truncated in the javascript functions Window.Message(), Window.Information() etc.

- **Case 12531**

The Select() functions for StressShell and LoadNode would bring up object menus that potentially contained other *INITIAL or *LOAD types.

- **Case 12507**

Pressing Cancel in a selection menu created by using the Select() function in JavaScript left any selected items flagged. This is not what you would expect and has now been fixed (i.e. if you press Cancel any currently selected items in the menu are ignored).

Seatsquash

- **Case 12664**

A new option has been added to seatsquash to import all nodes from a dynain file (instead of all parts or selecting parts). This is useful if you need to import a node which is used on a null beam (as the null beams are not written to the dynain file so with the original methods selecting by part you could not import the nodes)

Selection

- **Case 13433**

When selecting by ENTITY in object menus, filtering by Entity type (e.g. JOINT) was ignored when selecting by items in an area, and selection of items within that area was not restricted to the filtered type. (Single picks and menu selection were OK.)

Area selection (any method) of entities now respects the 'entity type' filter.

Shortcut

- **Case 14142**

When '+' and '-' short-cut keys were added to PRIMER (to give zoom in and out respectively) they always performed the zoom about the current window centre, regardless of the position of the cursor.

This has been modified so that if the cursor is in the graphics window these zoom operations will take place about the cursor position. If the cursor is outside the graphics window then scaling will revert to being about the window centre.

Spotwelding

- **Case 13236**

Reading a text spotweld file could make welds in a way that was inconsistent with reading the xml format. For example when one layer of a 3T weld was unable to be joined, PRIMER was making a 2T weld and reporting no error.

In 9.4 this has been corrected to work as per the xml file method, i.e. a bad connection point will be made with no weld FE and the connection table will appear for the user to fix the weld on completion of read.

- **Case 12625**

The “merge spotwelds” function will now attempt to merge un-made welds by making them first (having disabled the distance check) and performing the merge as before.

Translators

- **Case 14392**

The following bugs have been fixed in the NASTRAN input translator:

10. Data intended for row 6 of the MAT_54_5 card is now inserted into the correct row instead of row 7.
11. *DEFINE_COORDINATE_SYSTEM cards are now translated correctly.
12. Data from BEAMOR/BAROR cards are now written out to the corresponding CBEAM/CBAR cards under appropriate circumstances.
13. Parameters from CTRIA6 cards are now translated correctly.
14. Beam offset vectors are now written out correctly under appropriate circumstances.
15. Duplicate dependent nodes in NASTRAN RBE2 cards are now merged into appropriate *SET_NODE cards correctly.
16. CBEAM offsets for BOX1 sections in WIDE format are now read in correctly.

The following bugs have been fixed in the NASTRAN output translator:

1. CBEAM offsets for BOX1 sections in WIDE format are now written out correctly.
2. Parameters <G1Z> and <G2Z> from the DYNA MAT_54_5 card were being interchanged when written out to NASTRAN decks. These are now written out correctly.
3. *DEFINE_COORDINATE_SYSTEM cards are now written out correctly.
4. *INCLUDE statements in the master file would occasionally be omitted although the include files themselves were being written out correctly.
5. Trailing continuation strings for CBAR cards in wide format NASTRAN decks with beam offset vectors are now not written out.

- **Case 14149**

PRIMER's RADIOSS translator was not accounting for scale factors in tables - a recent addition. As a result, some tables were carrying incorrect scalar values.

Undo

- **Case 12482**

In the extrude and ruled meshing functions the right mouse button can now be used to unselect the last node.

Units

- **Case 14236**

During units conversion field VK (column 1, row 3) of material type 103 was being treated as dimensionless, and hence not changed.

This was wrong, the units of this field should be (stress / strain_rate**Vm).

PRIMER has been corrected to perform the proper conversion.

- **Case 13994**

It was possible to see an error message saying PRIMER was not able to change the field UNITS on a *AIRBAG_PARTICLE card when carrying out a units change, even if you weren't changing the units of that card.

- **Case 13692**

PRIMER will now take into account the DOF field on the *BOUNDARY_PRESCRIBED_MOTION card when assigning units to the load-curve referenced by this card. Previously PRIMER always set the y-axis to displacement - but it can also be rotation. Generally this causes no problems in PRIMER, but it would cause problems if this was a rotational prescribed motion and you were converting length units.

- **Case 13615**

Units conversions may have been applied twice to the following keywords:
*BOUNDARY_PRESCRIBED_ACCELERATION
*BOUNDARY_PRESCRIBED_CFD
*BOUNDARY_PRESCRIBED_ORIENTATION_RIGID
*BOUNDARY_PRESSURE_CFD
*BOUNDARY_PWP

- **Case 13583**

Unit changes are now applied to parameter DTSTIF on optional card C of the *CONTACT_ cards. Previously, a units change did not modify this field.

- **Case 13464**

A bug that would prevent unit changes for field DC in the *PART_ and *CONTACT_ editing panels.

User interface

- **Case 14175**

When certain 'odd' keystroke combinations were pressed with the cursor in the graphics window an error message saying 'Unprocess button -xxxx' (where xxxx is a number) could be generated.

This was harmless but it looked odd.

Unprocessed keystrokes in the graphics window are now ignored.

- **Case 14100**

A text popup has been added for DOF in the *BOUNDARY_PRESCRIBED_MOTION keyword editor

- **Case 13431**

When clicking REMOVE it was sometimes possible to see a brief flash of the old (pre release 9) 'picture' icons for this function.

These were harmless, but they have now been removed.

- **Case 13390**

The current labelling method is now highlighted blue on edit panel popups. Also, if the user changes the include file on the edit panel during a ‘create’, the label of the entity is automatically updated to account for that change.

- **Case 12892**

If Options > Menu Attributes is used to set a large scale factor (typically > 1.5) then the 'title bar' on the top of menu panels could become too small to hold the text of the panel title, meaning that it was not drawn. Historically this has just been an inconvenience, but now that macros are available that rely on Window titles it has become more important that these are visible, making the problem more urgent.

A minimum size equal to the height of the smallest font glyph has now been set for this title bar, meaning that panel titles will always be visible.

- **Case 12404**

Saving a menu window as a bitmap (by clicking on the top left icon and selecting 'Save->bitmap' was not being recorded to a checkpoint file correctly.

- **Case 8853**

The Oasys software suite now interacts correctly with the system cut / paste buffers on X11-based systems running the KDE window manager (typically Linux and some Unix platforms).

Text may be transferred in and out of Oasys applications via the cut and paste buffer in the following ways:

The pull down menu attached to the [-] button at the top left of dialogue and listing sub-windows now has a 'Copy to Clipboard' option which will place the window contents (as text) into the system cut / paste buffer.

Highlighting text in a text entry box will also place that text in the system cut / paste buffer.

Text selected outside the Oasys application can be 'dropped' (i.e. pasted) into a dialogue prompt or text box by using the middle mouse button as in traditional X11-based xterm usage.

Write

- **Case 13721**

When writing out the high frequency options DTHFF and BINHF on the *DATABASE_NODOUT card, these fields would be written into an incorrect field if a loadcurve was not defined previously on the card.

- **Case 12578**

Historically PRIMER has written single precision floating point numbers using 8 significant figures of precision.

This was implemented at the request of a client who was concerned that 8 sig figs input was originally being truncated to 7 sig figs after passage through PRIMER, giving a perceived loss of accuracy. However single precision floating point numbers in IEEE format are only good for 7.5 significant decimal figures, making the extra 8th digit of questionable value. In addition it can give rise to anomalies such as the value 0.3 being written as 0.29999998.

Subsequently we have been asked to provide 'sensible' looking output, so an extra 'rounded' option has been added to the dyna_output_style output preference, which will round single precision floating values to 7 significant figures for output, and also remove any trailing zeros. This produces output that looks better since it corresponds more closely to what a human being would write.

For backwards compatibility the default output is unchanged (option 'common').

- **Case 12449**

In the model list, the 'Title' field could get stuck in a greyed out 'writing' phase.

Xref

- **Case 12166**

Some item types in the cross references viewer had confusing (or not obvious) names. They have now been replaced with the correct names.

2.2 Oasys D3PLOT

2.2.1 Bugs Fixed in 9.4.2

Airbag

- **Case 15961**

Under Display options, Airbag Particle, it is possible to show a detailed panel giving the status of all gases in airbags. Among other things this shows the number of particles per gas, and this value can be different for each state.

The panel would show the number of particles per gas for the state that was current when the panel was mapped, but it was not being updated as the current state changed.

This is now fixed: if the detailed gases panel is mapped than the number of particles per gas is now updated to be correct for the current state.

The 'current state' is defined as the (static) state shown in the first active window for the model, so the number of gases will not be updated during an animation but only when it stops.

Capture

- **Case 15249**

If you had multiple models open in different windows, each with different run times and you captured an animation, D3Plot would only capture the animation in each window up to the number of frames in the last window. If this wasn't the maximum number of frames of any window, then the animations in other windows would not get captured fully.

This has now been fixed and the animation will now use the maximum number of frames in any window.

Cut section

- **Case 16069**

If 2D Graphics mode was on and XY data was plotted, if you then saved the data to a .cur or .csv file the data points would all be (time, time). Now fixed.

- **Case 15600**

Cut-section forces in D3PLOT are intentionally calculated in unblanked elements only, and this works correctly. However if the entity switch of an element type is turned off, which effectively blanks it, the cut section forces in elements of that type are still computed and this has caused confusion.

Therefore the code has been modified so that if an element is blanked, or its entity switch is turned off, then forces will not be computed for that element.This gives the more intuitive result that 'forces are only computed in elements you can see'.

- **Case 15112**

When cut-section forces and moments are calculated in 'basic' space the results have to be transformed to the global system about the centroid of the cut plane.

This transformation was wrong for the per-part moments reported when 'forces' are output. Results were correct for the global moments, and all forces were correct for both per-part and global results.

Per-part moments are now reported correctly.

Data access

- **Case 15245**

If the surface to plot was set to Max all / Min all / Mag all, then the values returned by D3Plot for Engineering Strain (ENG_MAJOR_STRAIN, ENG_MINOR_STRAIN and ENG_THICKNESS_STRAIN) could be incorrect.

- **Case 15242**

If the surface to retrieve data from was chosen by layer (e.g. Surface = “Layer 3”), then the value of the thick or thin shell strain was incorrectly always given as the bottom surface.

It should have returned the top surface if the layer was in the top half of the shell and the bottom surface if the layer was in the bottom half of the shell. If it was in the middle it should have averaged the two.

This has now been fixed.

- **Case 15145**

If REPORTER was used to generate an image in D3PLOT containing data read from the LSDA (binout) file (springs, spotwelds etc) then the values reported in the image could be zero while if the same image was captured interactively the correct values were reported. This problem was caused by the image being created before reading of the LSDA file was completed, and was more likely to occur when the files being read were located on a slow disk system. This problem has been fixed in 9.4.2.

Deform

- **Case 15353**

The reference state function might have returned incorrect values for spotweld and seatbelt entities. This could happen if there was more than one subtype of these entities in the model and some of the labels were the same.

- **Case 15128**

If data was contoured with the reference state switch turned on and the surface to contour was set to MAX ALL, MIN ALL or MAG ALL the data values displayed would all be 0.0.

Envelope

- **Case 15387**

If the state slider was set to state 0 and you then turned on envelope plotting, the values displayed would all be zero (setting the state to anything other than 0 gave the correct results). Now fixed.

General

- **Case 15649**

If the Part Screen clipping option (Display Options->Window Dressing) was turned on, the dimensions used to clip the window were incorrect if the window size changed. Fixed now.

- **Case 15648**

If more than two models were open and the option to list max and min values under the title had been turned off, D3Plot would write 'Max/min for model' over the top of the title. Fixed now.

Graphics

- **Case 15562**

When reading a very large model into D3PLOT it was possible that the memory limit warning logic could be triggered when building the initial animation. On Windows machines with more than one processor, it was sometimes possible for the issuing of the warning to cause severe and unpredictable consequences including the graphics going mad, spurious warning messages and the process locking up. The only solution would be to kill the process. This has now been corrected.

- **Case 15191**

When full hidden line overlay is turned on, a problem can arise that the outlines of a layer of shells very close underneath an overlying layer can appear to 'poke through'. This has been improved, although it may still occur in some circumstances.

- **Case 15108**

When principal stress/strain (criterion) plots were performed on a model in multiple windows, and different windows showed different principal stresses (max / mid / min), then the contour bars could get 'stuck' showing the range of the first window. This could also result in the symbols in the 2nd and subsequent windows having the wrong lengths, albeit using the correct values and in the correct directions. This has been corrected.

Menus

- **Case 15692**

If in version 9.4 of D3PLOT the main tool menu was collapsed to increase the size of the other menus then the buttons in the alternative popup were not processed when they were clicked on and error messages were generated in the console window.

This has been fixed in 9.4.2.

- **Case 15581**

If the Windows Layout menu was dismissed using either the Escape Key or the X in the top right corner of the menu, then the menu could not be displayed again until another D3PLOT Tools menu had been displayed.

- **Case 15311**

The popups in the 'Other' data components menu could only be invoked with a right mouse button click. They can now be invoked with a left button click as well.

Metal forming

- **Case 15269**

In release 9.4 the default background for LC, Vector and Criterion plots changed from 'hidden' to 'shaded', requiring normals to be generated for these plots.

Unfortunately the flag to generate normals was omitted in the case of major/minor principal strain criterion plots invoked from the Utilities, Metal forming menu. This could cause a crash if such a plot was requested for a state that had not previously been drawn in some sort of shaded mode (which would generate the required normals).

This has been fixed in 9.4.2, but in the meantime a workaround is to perform a single animation pass through the model in shaded mode, so that normals are generated for all states, before requesting a principal strain plot in the Metal forming menu.

- **Case 15261**

In release 9.4 the ability to blank and unblank strain paths was added into the FLD plot function. In doing this, a bug was introduced such that sometimes a path might not be plotted. This has now been fixed.

PDF

- **Case 15189**

When capturing a PDF image, if the figure number was left blank, the text 'figure' would still appear at the bottom of the page and on some machines some random text would follow. Both these problems have been fixed.

This applies to PRIMER, and T/HIS as well as D3PLOT.

Part tree

- **Case 15172**

If groups were displayed on the part tree and then modified in some way (name changed, deleted, etc) then the part tree would not get updated unless the user manually refreshed it. This has now been fixed and it will update automatically.

Properties

- **Case 15705**

When multiple windows are open on a model and a properties file is reloaded, then a subsequent 'update' in the properties panel may only redraw the 1st window to show the revised properties.

Now fixed so that all windows of a model will be marked for refresh when properties are reloaded.

Quick pick

- **Case 15638**

Windows builds of D3PLOT 9.4.1 and 10.0 (dev) suffered from the potential to 'hang' while screen-picking if the pick point was just outside the true structure.

Scripting

- **Case 15396**

The JavaScript interface in D3PLOT contained an error when writing to user-defined binary (UBIN) data components. These implicitly (and mistakenly) assumed that once a UBIN component was created it, or another UBIN component, would be written to before read operations took place on other UBIN components.

This was due to a logical error in programming and has been fixed.

Selection

- **Case 16042**

In the Write menu, if the entities were selected by screen area, then the 'Unsel All' button was pressed on the selection menu, D3Plot could crash if you tried to select the entities by screen area again. Now fixed.

- **Case 15265**

If a list of elements was selected for KEYWORD output in the WRITE menu by dragging across a screen area then D3PLOT could crash. If the model only contained 1 element type then D3PLOT would be OK. This has been fixed.

Sketch

- **Case 14969**

The use of the DEL key to remove transient and sketched graphics from the display was broken in release 9.4.

This has been fixed.

T/HIS link

- **Case 15586**

If the D3PLOT->T/HIS link was used with a model containing SPC data in T/HIS then the following error message could have been generated incorrectly.

'The list of entity IDs sent from T/HIS for model 1 do not match the IDs in the PTF file. Any unknown IDS have been ignored' .

This has been fixed.

User interface

- **Case 15472**

If a session contained multiple models, and the user had been working with a 'per model' operation (for example XY_DATA), and all but one of the models were subsequently deleted (including the last model fro which the ‘per model’ operation had been performed, then it was possible that the menu for that operation would become unresponsive to input. This has been fixed.

- **Case 15163**

I version 9.4 and 9.4.1 the command line syntax for turning on/off the display of target markers didn't work. This has been fixed in 9.4.2

User defined

- **Case 15333**

Fixed two problems related to user-defined components:

(1) In simple formulae there was no trap in the 'to the power of' operator (** or ^) to detect an attempt to raise a negative number to a non-integer power.

On some platforms this caused a crash in the maths library, but on others execution would continue with unpredictable answers. Simple formula evaluation now been modified so that, in common with other attempts to evaluate illegal expressions (e.g. sqrt of a -ve number, divide by zero), an attempt to calculate an illegal power simply returns zero for that part of the expression.

(2) When user-defined components were used for beams it was possible for the max/min values shown on plots, and also scalar values extracted for WRITE, XY_DATA, etc to be those of the 1st such component used, and not to get updated when a different user-defined component was selected. This has now been fixed.

Utilities

- **Case 15119**

If you had more than one model open and then closed them leaving just one, the Part selection menu in the PTF Compress utility couldn't be invoked. Fixed now.

- **Case 15117**

The deletion status of SPH elements would get lost if writing out a file using the Utilities->PTF compress function. Fixed now.

- **Case 15061**

In Utilities->Compress, Extra variables would not be written out even if they were selected. Also, the tick did not get removed from the tick box after deselecting the option. Both these problems have been fixed.

Views

- **Case 15437**

If you used the Target and Eye function from the dialogue command and had multiple windows open, D3Plot could complain that both co-ordinates for the eye and target position were coincident and the view would not get updated.

This was because when setting the co-ordinates through the dialogue command it only applies to the current window, and the other window's co-ordinates are left at their defaults of (0,0,0). When it came to updating the views, if D3PLOT found a window with coincident co-ordinates it stopped looking at the other windows, so nothing got updated.

This has now been changed so that if it does find a window with coincident co-ordinates it will just move onto the next window, issuing a warning about coincident co-ordinates in window.

To set the current window (for example, to set the target and eye positions for other windows), use /CW.

- **Case 15001**

Case 15001: If a view name was a subset of another, as in:

View #1: This_is_my_name
View #2: This_is_my_name_as_well

The command /view get this_is_my_name gave the 'error: ambiguous' message, and if this was in a command file it would get stuck in a loop.

The name parser has been updated so that it now accepts a name if all the characters match, even if it is a subset of another name.

The same logic has been used for selecting group names.

Write

- **Case 16041**

Lumped mass components could not be selected in the WRITE panel. Fixed now.

Ztf

- **Case 15686**

When D3Plot tried to auto-create a ztf file on a PC, if there were spaces in the pathname of the Primer executable it would fail. Now fixed.

2.2.2 Bugs Fixed in 9.4.1

Airbag

- **Case 14912**

LS-DYNA 971 R5 onwards has a revised Airbag Particle output format in the .ptf (d3plot) file.

Support for this new format has been added to D3PLOT 9.4.1.

(This change is backwards compatible with older versions of LS-DYNA. D3PLOT detects the format used automatically, and will read older files correctly without any intervention on the part of the user).

Ale or euler

- **Case 14770**

ISO plots of ALE materials have always looked a bit 'lumpy' in D3PLOT, and this is because the boundary set for the ISO contour band is 1.0, i.e. 100% of the material.

This has been changed to 0.5, i.e. 50% of this material, which gives a much smoother appearance.

(ISO plots of the dominant ALE material still have bands set at integer intervals, i.e. 100% of each material, since this is the only way that separate boundaries can be shown).

Contour

- **Case 14532**

When D3PLOT has multiple graphics windows the 'tabs' at the tops of panels [W1] [W2] etc show which windows the settings in the panel will be applied to.

When a command file was recorded and then played back it functioned correctly if the user had (de)selected tabs, but the tab buttons themselves were not (un)depressed to show the current selection status.

This meant that in subsequent interactive operations in the panel the Windows for which the panel was active might not be represented accurately by the tab buttons.

Command file playback will now set [Wn] and [Mn] tab buttons correctly.

Data access

- **Case 14850**

When LSDA (binout file) output is present in an adaptively remeshed analysis then D3PLOT may crash when the model is closed.

This is because it assumes that each remesh family has LSDA data present, whereas it seems that it is in fact only there for the base family (original mesh). The crash occurs when it closes the model

because it is trying to close successive LSDA file families when in fact only the base family appears to exist.

This has been fixed by only closing the LSDA (binout) file once.

However it is not clear how, or indeed if, LS-DYNA handles LSDA output in the adaptively remeshed case, and users are advised to take care in this situation.

Deform

- **Case 14851**

If an invalid node number was typed into the textboxes in the Deform menu, D3Plot could crash.

Deleting

- **Case 14796**

When analyses use material models with failure elements can be deleted as the run proceeds, and 'deleted element tables' at the end of each state tell the post-processor which elements have died so that they can be removed from plots.

Some versions of LS-DYNA have a bug which means that elements are duly marked at deleted at the appropriate state, but the deletion flag is missing (seemingly at random) in later states. This means that the post-processor thinks they are 'alive' again and displays them, which can lead to messy plots since deleted elements have no stiffness and may undergo immense deformations.

Since there are situations in which elements may 'die' and then 'come alive' again (for example the *DEFINE_CONSTRUCTION_STAGE keyword) the default in D3PLOT is to treat deletion in each state as being independent, and this behaviour has to remain as the default.

Therefore to deal with this LS-DYNA bug a new 'No Reincarnation' switch has been added to UTILITIES, FAILURE OPTIONS panel. If selected it goes through all states in all models setting the deletion status of each element to be a logical OR of 'status in this state' and 'status in the preceding state', which means that deletion propagates forwards in time through an analysis and elements can never 'come alive' again.

Errortrapping

- **Case 14694**

If a 'start_in' directory was specified in the 'oa_pref' file and it was overwritten by one specified on the command line then an ERROR message was generated. This has been changed to a warning message as the ERROR message could confuse REPORTER.

Graphics

- **Case 14913**

When a model contained dampers or seatbelt-related items a crash could occur when picking parts by area.

This was due to an internal error that assumed that all these types had a parent part id when in fact this is not true for (say) sliprings.

- **Case 14688**

If more than one model was read into a window and the first model had 0 states (i.e. only initialised in Dyna), when you dragged the states slider bar in the bottom right corner, it would always jump back to state 0.

Groups

- **Case 14797**

The binary groups file (job.grp) used by D3PLOT to manage groups causes problems when the job directory is on a read-only file system since it cannot be written alongside the other job files.

There is a fallback position of writing it to $pwd, or to the user's home directory, but while this works it is not satisfactory for managing large numbers of files.

Therefore two new preferences for D3PLOT have been added:

d3plot*group_file_location:
d3plot*delete_group_file: True | False (default = False)

The first of these, if specified, overrides the normal group file placement rules and opens the file in the specified directory.

The second (regardless of the setting of the first) will delete the group file when the model is closed or the D3PLOT session ends. If unset this default to False, i.e. do not delete file.

Part tree

- **Case 14742**

If a *PART was in the master file and a *ELEMENT referencing the part was in an Include file, D3Plot would not show the part on the Part Tree.

Quick pick

- **Case 14828**

When multiple (large) models were present in a window 'quick pick' could be slow both to select items and also to update the image.

There was no single reason for this, but rather several places where calculations were inefficient, or in some cases redundant.

The process has been speeded up and subjectively (it's hard to measure) 'quick pick' is somewhere between 2x and 3x faster when large multiple models are being used.

- **Case 14800**

A crash occurred in one model when using 'quick pick' by include file, and the model contained solid spotwelds.

The crash was actually due to errors determining the part id of the spotwelds, so although it occurred during quick-picking it could equally have happened in other contexts where the part id of a spotweld needed to be determined.

Read

- **Case 14823**

When two models are placed in a single window and an animation is played for the first time a crash could occur if the number of states in the two models was different.

This was due to an error in the (parallelised) 'read ahead' of information, which was looking for data that wasn't there.

A supplementary error was that 'read ahead' was not working properly for the 2nd and subsequent models in a window. This would not have caused problems, but it meant that the data read would not be parallelised for these models which would slow it down a bit.

Scripting

- **Case 14502**

Displaying the model filename(s) instead of title (turned on in Display Options, Windows dressing) caused a crash on HP-UX.

This was traced to an internal error that could have affected other operating systems too.

2.2.3 Bugs Fixed in 9.4

Airbag

- **Case 13919**

The output of airbag particle data in the D3PLOT (.ptf) file from double precision ls971R4 has been changed by LSTC, meaning that early releases will write a format that is different to later ones. The change alters the number of bytes in the file and means that versions of D3PLOT prior to release 9.4 will fail to read the more recent 971R4 double precision data.

D3PLOT 9.4 will now examine the file's contents and adjust its reading strategy as required, so that airbag particle output written in any of single precision, double precision (old) and double precision (new) will now read in correctly.

- **Case 13179**

In D3PLOT 9.3.x the ‘Display Options’ panel for airbag particle plotting the ‘Leakage’ value showed

1 = porosity and 2 = vented

This was our best understanding of the documentation at the time, but it transpires that the values should be swapped giving:

0 = In bag
1 = Escaped due to porosity
2 = Escaped through vent
3 = MPP error

D3PLOT 9.4 now shows this correctly

Contour

- **Case 14354**

D3PLOT gave the option of reporting a mass for SPH elements, which was computed on the particle volume times its density, with volume computed from the 'radius of influence', since mass is not reported explicitly in the output database.

However this is not necessarily the mass as defined on the *ELEMENT_SPH card so to avoid reporting potentially wrong values this data component has been removed for SPH elements.

- **Case 14273**

D3PLOT 9.3 onwards shows an optional 'max/min' value on data-bearing plots, and also sketches the elements or nodes which have the max and min values.

If an 'explosion' vector was defined to separate parts the identification of the max & min elements/nodes was shown at the 'unexploded' coordinates.

If explosion vectors are active the max/min labels will be drawn in the correct positions.

- **Case 14017**

Plotting ‘Min All’ or ‘Max All’ or ‘Mag All’ for strain based components could produce incorrect answers for shell and thick shells.

- **Case 13951**

D3PLOT could crash when plotting outward normals if a model contained airbag particles.

- **Case 13879**

The Data->Component button was greyed out if a model contained only SPH elements.

- **Case 13638**

When using the option to click on the contour bar to limit the items displayed to those within a given band, this failed for the component ‘displacement_resultant’.

- **Case 13076**

This bug affected Deform> Reference Node, with the same model being shown in multiple windows, when a different reference node had been requested in each window. In D3PLOT 9.3 this did not work correctly – all windows would display as if a single reference node had been defined. There was no problem with different models each in a different window, with a different reference node for each model. The problem occurs only when different reference nodes are used in different windows for the same model.
Each window on a model will now show the correct reference node settings, should they be different.
When WRITE and XY_DATA give results (e.g. displacement) relative to the reference node, be careful not to use different reference nodes in different windows for the same model – in this case, it may be hard to predict which reference node will be used to calculate the WRITE or XY_DATA results.
The same fix and comment applies to the three nodes used for Shift Deformed.

Cut section

- **Case 14257**

Two errors have been identified in the processing of cut-section forces through beam elements.

(1) When beams did not have any orientation node (which is legal for circular sections) then D3PLOT was failing to calculate a local axis system for them and reverting instead to a unit matrix, effectively orienting such beams for the purposes of cut-section forces in the global axis system.

If no third node is defined then the 'long' X (axial) axis N1N2 is now computed correctly, and then local (transverse) Y and Z axes are computed by a cross-product with global X or Y to form a proper right-handed system.

This means that the beam axial direction is now computed correctly for cut-section force purposes,

and that some reasonable local Y and Z axes are also defined, although this latter pair may not match the orientations used in LS-DYNA.

If the orientation of beam transverse axes is important users will need to define a 3rd node in order to provide an explicit XY plane for these beams.

(2) There was an error in the way that beam cut forces were being computed.

Forces in a beam are reported as Fx (axial), Fy (transverse Y) and Fz (transverse Z), and this was being treated as a vector [Fx, Fy, Fz] when transformed into the plane of the cut section.

This was wrong: Fx is a 'direct' force, but Fy and Fz are shear forces and should really be written Fyx and Fzx (i.e. force in Y and Z on a plane of constant X). As a consequence they should have been assembled as a tensor for transformation purposes:

[Fx]
[Fyx 0.0]
[Fzx 0.0 0.0]

The beam cut section force calculation has been amended accordingly.

(Beam moments [Mxx, Myy, Mzz] are a vector quantity and were being treated correctly as such, so no change in the computation of local cut moments for beams has been made.)

Data access

- **Case 14318**

When data at all 8 integration points of solid elements was written (NINTSLD = 8 on *Database Extent Binary) D3PLOT had a tendency to read only the 1st point's data and then treat this as the centre value.

Results for all 8 points are now averaged when read to store a single value, so results are at least consistent with single int pt output.

- **Case 13850**

LS971R4 contains the option to output added mass at nodes (or %age added mass) to the PTF (d3plot) file, via the MSSCL flag on *DATABASE_EXTENT_BINARY. D3PLOT 9.3.x could not read files with this option.

D3PLOT 9.4 now handles this data, and the component MASS_SCALING is now available for plotting and scalar data output.

Note that it is not possible for D3PLOT to tell from the PTF (d3plot) file whether the values are added mass (MSCCL = 1) or %age added mass (MSCCL = 2). It is up to the user to determine this for themselves.

- **Case 12342**

This sequence could sometimes generate warning messages about invalid windows:
Open 2 or more models
Use “Write compressed PTF file”
Dismiss Compress panel
Delete a model
Re-open “Write compressed PTF file” panel

Database

- **Case 12817**

D3PLOT 9.3 would show a default file to open if one were present in the 'start in' directory.

However if more than one eligible file was present then the choice of which was shown was a bit arbitrary, and could depend upon their creation date on the disk meaning, in particular, that if .ptf and .rlf (or d3plot and d3drlf) were present it would be likely to select the dynamic relaxation file (rlf) instead of the main ptf file.

This behaviour has been modified so that it will now prefer the main ptf (d3plot) file over the dynamic relaxation one (rlf/d3drlf) if both are present.

Deform

- **Case 12669**

When selecting a node in the ‘Fix Node’ panel, this is now copied over to the ‘Ref Nodes’ panel (and vice-versa) as currently happens for the Shift Def nodes.

FEMZIP

- **Case 13221**

When FEMZIP/UNZIP support was first introduced into D3PLOT 9.3.1 it was necessary to use the file extension '.fz' for D3PLOT to treat a file as FEMZIPped.

Detection of FEMZIPped files is now carried out automatically by inspecting their contents, so files may have any name (with or without an extension) and their format will be determined automatically.

General

- **Case 14209**

If you had more than one model in a window and only displayed one model at a time, the header for the max/min values would say 'Max/min for Model 2', 3, 4 etc, but not for Model 1.

- **Case 13361**

Screen picking colours off elements (other than SOLIDS) from the properties panel gave a different colour to the one picked.

- **Case 13234**

If the directory used to save a settings file was changed then D3PLOT would set it back to the original directory after the settings file has been saved. Version 9.4 has been modified so that the modified directory is now used as the default until the user changes it again.

- **Case 12550**

If a model was re-read in D3PLOT while using the D3PLOT->T/HIS link then the status of the switches in the ‘Database’ part of the Entity panel that control the display and labelling of some entity types would be reset to the program defaults. Version 9.4 has been changed so that the status of these switches isn't reset.

- **Case 12470**

If a multi-page layout was used in version 9.3 of T/HIS and D3PLOT and the positions of items was changed by dragging (move or resize), then after a ‘page up’ and ‘page down’, the layout would revert to how it was before you dragged. In T/HIS and D3PLOT 9.4 the positioning of graphs and

D3PLOT windows within multiple pages has been enhanced to allow an item to be placed in different positions on multiple pages.

- **Case 12262**

If the top ‘Done’ button was pressed while picking a node in the ‘Target Marker’ panel, this could result in an incorrectly mapped ‘Utilities menu’, with some of the Target Marker buttons still showing.

The top ‘Done’ button is now greyed out whilst doing a picking operation so this cannot occur.

- **Case 8256**

Where the model contents (number of nodes, etc) listed in the THF and XTF (d3thdt and xtfile) files did not match the PTF (d3plot) file (e.g. if the files came two different models), D3PLOT 9.3 could get stuck in a loop. In Version 9.4, if the model contents are different, an error message is now generated in T/HIS and the THF/XTF file is ignored.

Where the THF (d3thdt) file contains time-history nodes that do not exist in the PTF (d3plot) file, a separate error message was given for each unrecognised entity. In version 9.4, a single message is given showing all the unrecognised nodes

Generate

- **Case 12409**

If a pathname of a model contained spaces, D3PLOT was not able to read the model list file that Reporter produced when generating a report.

Graphics

- **Case 14317**

The 'quick pick' option to change item colours appeared not to work when the plot was in hidden-line mode. The colour change did in fact take place, but it was only redrawn in the new colour when the plotting mode was changed.

- **Case 14258**

In models with beams where no 3rd node had been defined to specify the transverse beam axes the plotting of data on these beams could be a bit variable when animated.

The problem was that the 'thick' axes used for a CT plot, or the projection axes for a DP plot, require that some sensible local axes be computed and this is normally done from the cross product of the axial (N1N2) vector and the transverse (N1N3) one.

Where N3 was undefined there was some fall-back logic to try to derive sensible transverse vectors, but some of the tolerances in this were too tight resulting in variable behaviour for some beam orientations. This showed up particularly badly when small displacement analyses were animated with large magnification factors.

The calculation of local axis systems for plotting has been improved in this 'N3 = 0' case, and this variability should no longer occur.

- **Case 13945**

When performing wireframe plots of models with solid elements (showing all element edges), it could sometimes be the case that edges on triangular faces of wedge and tetrathedron elements would not be shown.

This was due to rendering these faces as degenerate quads inside the graphics driver, which could confuse it and make it believe that they were back-facing resulting in their borders not being drawn.

Triangular faces on 3D elements now use the correct number of nodes (3) to render the face, and the face edges are now drawn correctly in wireframe mode when 'all edges' are being rendered.

- **Case 13573**

Autoscaling in D3PLOT ignored Airbag Particles, using only conventional nodes and elements. This was deliberate because experience with 'leaky' airbags showed that when particles flew off into the distance they could cause inappropriate scaling. scales.

However if only particles were being displayed then autoscaling would fail saying that 'nothing was visible', and this was unsatisfactory.

Therefore the logic has been changed so that a traditional autoscale still takes place, based only on nodes and conventional elements, but if this shows nothing then the autoscale calculation is also performed on airbag particles if present.

This is a compromise, but it gives reasonable behaviour.

- **Case 13445**

When performing dynamic viewing operations on Windows platforms (only) the view could suddenly 'jump' if the following sequence of events occurred:

1. <shift>/<ctrl> + <mouse button> press started in graphics window
2. subsequent mouse motion took the mouse into a different sub-window
3. mouse button released while the mouse was still moving rapidly

This resulted in the coordinates reported at the mouse location when the button was released being reported wrongly, and hence the view 'jumping' to something different.

Stopping the mouse movement before releasing its button, or not taking it into a different sub-window (or even, possibly, having a much faster computer) would all prevent the problem occurring.

- **Case 13366**

When the beam plotting mode was changed from the default 'line' display to 'true section', giving a 3 dimensional shape to beams, the appearance of a shaded plot might not update immediately.

- **Case 13246**

When display of unattached nodes was switched on then they were drawn correctly but ignored blanking, remaining on the screen even when blanked.

- **Case 13057**

A bug was reported that with perspective turned on and very large degrees of zoom (large increases of scale) the screen could sometimes jump to all one colour due to foreshortening of the view bringing the eye point 'inside' the structure.

This was due to the way zoom affected only scale, but not perspective distance - tantamount to a photographer standing in the same place and putting a longer lens on his camera.

In Version 9.4, zooming with perspective turned on adjusts both the scale and the perspective distance (equivalent to the photographer walking closer to the target with the same lens). It is still possible to get the eye point 'inside' the structure using the revised method; but because the effect is more natural, it is easier to perceive what is happening - the transition from 'outside' to 'inside' should be easier to understand.

- **Case 12533**

On NVidia graphics hardware D3PLOT would sometimes pause briefly when animating a sequence, giving a slightly jerky result. The problem could be solved by turning off the wireframe overlay.

Testing has revealed that a long unbroken sequence of 'line' primitives (which is how the overlay is

rendered) causes this behaviour, and that breaking this up improves performance. Therefore the sequence length is now limited, and testing with a range of models on different platforms and graphics cards suggests that this has cured the problem and, in most cases, given faster rendering as well.

- **Case 12330**

When running D3PLOT from REPORTER the size of the original graphics window is captured and reused when generating reports so that images come out the same size.

However if the machine on which the REPORTER file is replayed has a smaller screen than that on which the template was captured then the window can end up being bigger than the bounding master window or, in severe cases, larger than the display itself.

This is not successful because subsequent 'captures' of the window to image file either fail, or include part of the desk-top, or contain lots of black space.

Therefore the window size is now clamped to the boundaries of the enclosing master box.

Include

- **Case 13608**

After blanking include files from the part tree in D3PLOT and then reversing the blanking, it could become impossible to pick nodes.

Menus

- **Case 14433**

When D3PLOT was run with the command-line option '-exit' (usually to terminate after running a command file) it could leave a checkpoint file (cp_...) behind. This will now be deleted as part of the auto-exit process invoked by '-exit'.

- **Case 13786**

The tick marks in the top menu Display=>Options popup did not update when you pressed them, which could cause confusion.

- **Case 13534**

In D3PLOT 9.3 and 9.3.1 the menus would not update correctly and nothing would happen if you selected either the 'Part Tree', 'JavaScript' or 'Data' menus followed by the 'Layout' menu and then went back to the previous option. If you used a different option after the 'Layout' then everything was OK.

Metal forming

- **Case 13957**

If the key is turned on for a ‘Strain Path’ plot and a different number of shells were selected the labels and symbols could be drawn incorrectly.

Movies

- **Case 13518**

On Windows platforms only, the background image displayed from an AVI file could be 'skewed' in a few instances. This has only been observed in files written in BMP formats, and occurs when the window width from which the image was originally written was an odd number of pixels wide.

Files should now display correctly.

Part tree

- **Case 13512**

D3PLOT would crash if an attempt was made to add seat belt entities to the part tree using the 'Type' popup.

Read

- **Case 14179**

When multiple models are read, deleted and reread it is possible that a subsequent 'reread' operation may attempt to read in the wrong model.

- **Case 13691**

If a second or subsequent model was read into D3PLOT and the directory contains a version 9.3 or later settings file, the information in the settings file about the number and location of graphics windows was being processed.

If this information was generated when the model was in window 1 and the second model had been read into window 2 the second window would be automatically closed as the information in the settings file said there should only be one window.

Scripting

- **Case 13473**

The Javascript function GetUbinData did not work.

Selection

- **Case 13484**

With grey background, it was hard to see the rubber-band lines e.g. when zooming or selecting by area. The colour of the rubber-band lines has been changed for the grey background case.

T/his link

- **Case 14442**

If in 9.3 the 'Pick Visible' option was used in the D3PLOT > T/HIS link to pick items then the D3PLOT quick pick menus would not be reset if the T/HIS read menu was dismissed or if the user swapped back to a D3PLOT menu.

- **Case 13822**

In version 9.3 and 9.3.1 of D3PLOT the environment variable 'OASYS' had to be set for D3PLOT to find the T/HIS executable for the D3PLOT->T/HIS link. Version 9.4 has been modified so that if this variable (or OA_INSTALL) is not set then the directory containing the D3PLOT executable will now be used.

User interface

- **Case 14275**

If two or more models were placed in a window and the DEFORM, EXPLODE option was used, then the M1, M2, etc tabs on top of the panel could get confused and appear to be out of synch with what was actually selected.

- **Case 13205**

In the Write menu, when outputting data to file, if the user did not specify a filename then the output would be sent to a file called either 'fort.12' (or 'ftn12' depending on the machine type). A default filename is now used instead.

- **Case 13204**

The ‘Files’ button on the XY DATA panel wasn't setting the .cur filename textbox as inactive.

- **Case 13203**

When working with multiple models with different numbers of states, the main 'States' slider could sometimes “snap back” after being moved to a state that exists in some but not all of the models. This would occur if the model in the last window to be updated had fewer states than the user-input slider position.
This behaviour has been improved so that when the slider is moved (or an explicit state number or time is entered) then the slider will move to that position regardless of the content and order of models in windows.

The time displayed will be based on the model in the first active window in that box (as controlled by its W1, W2, ... tabs); except that if the current state exceeds the number in the first model's window it will show that of the next window's model, and so on.

This is not perfect, and reflects the fact that a single slider can only show a single value, whereas multiple models may in fact be at different 'current' state numbers.

- **Case 12416**

If the environment variable MENU_AUTO_CONFIRM is set, typically for batch mode usage, then 'help' texts do not appear since they are treated as 'map and confirm' panels which are suppressed by this variable. This is correct behaviour and is not, in itself, a bug.

However if a user leaves this variable set while using D3PLOT interactively he will think that 'help' and other listing/warning panels have disappeared, or gone wrong somehow, since no reason is given for their non-appearance.

Therefore if these panels are invoked, but are not mapped because of this variable, a brief explanatory message is now written to (the controlling terminal window) explaining what has happened.

- **Case 12296**

When the overall D3PLOT window is not very tall, and scroll-bars are needed on some panels, these were not getting computed and displayed during [Data, Envelope] or [Data, Beam, Attributes].

User defined

- **Case 13730**

User-defined components based on formulae or simple Javascripts using 'primitive' data components would, in some circumstances, not give the correct results if the Max_all, Min_all or Mag_all 'surface' type was chosen. (The result was correct for a single, specific integration point or surface.)

The result would tend to be that of the most recently used specific surface.

User-defined components using 'primitive' data components via formulae or Javascript will now evaluate correctly in these cases.

- **Case 13601**

When using 'UBIN' user-defined data components in the Javascript interface D3PLOT normally writes these to disk in the same directory as the model database (.ptf etc) files.

However in cases where the directory containing the database files is read-only this will not work, and the files are now placed in the system temporary directory (typically /tmp on Unix/Linux, and USERPROFILE\Local Settings\Temp on Windows).

- **Case 13379**

In 'simple formula' user-defined data components an attempt to perform a divide by zero, or take the remainder of a divide by zero (modulo zero), returned an evaluation error which halted computation. This was not helpful and required some users to resort to Javascript to avoid the problem.

This has been changed so that divide by zero simply results in an outcome of zero, and modulo zero returns the value being divided unchanged. Neither situation now generates an error.

Utilities

- **Case 13442**

If a model was compressed with the PTF compress function in D3PLOT, the numbering tables for parts could be written incorrectly. This would only occur if the part numbers were not in ascending order.

This could cause problems, for example when reading in a group ascii file.

- **Case 13332**

Writing settings files with long pathnames could cause D3PLOT to crash.

Write

- **Case 14081**

If WRITE was used, and the sub-component selection panel within it also used, then menu corruption could occur if a second model was read in and a second cycle of WRITE, select data sub-component was performed.

The second model read would, in this context only, invalidate the component selection sub-menu with unpredictable (but bad) consequences.

- **Case 14055**

If parts were blanked with a cursor pick and then you went to Write->Keyword Data->Parts->All Visible, selected to write out nodes and elements, the resulting keyword file would contain elements from the blanked parts (although not the nodes).

- **Case 13630**

D3PLOT could crash if you selected an object in the Write->Scan menu, clicked on 'Done' and then tried to go into the 'Keyword data' menu.

- **Case 13625**

If a model contained springs or seatbelts and the ztf file was not present or did not contain information for these parts, writing an initial keyword file by selecting Parts->All would mean only a subset of the nodes were written out.

- **Case 13206**

In D3PLOT 9.3 and 9.3.1 the time written out to the top of a file generated using the WRITE menu would not be written correctly on SGI machines.

- **Case 12549**

The nodal restraints of nodes were always written out to an initial data keyword file.

There is now a switch in the 'Write' panel to select whether to write this out. (Off by default).

Ztf

- **Case 13687**

Material labels displayed from the entity panel were incorrect. This was because the ztf file was storing them incorrectly.

2.3 Oasys T/HIS

Note: There is a known bug in T/His that has not been fixed in 9.4.2:

Images

- **Case 14933**

Pdf images are not captured correctly on PCs if a graph has a background image and the resolution is set to 2x or 4x.

2.3.1 Bugs Fixed in 9.4.2

Data access

- **Case 15177**

If multiple models containing Airbag Particle data were read into T/HIS 9.4 or 9.4.1 then T/HIS could crash when the AIRBAG->CPM PART data menu was selected. This has been fixed in 9.4.2.

FAST-TCF

- **Case 16115**

If a FAST-TCF script is generated for either the 'current page' or a specific page where the page wasn't page 1 then the image generation command at the end of the script is wrong.

If for example page 3 was captured the FAST-TCF script would contain the command to generate all the graphs as though they were on page 1 when the script was replayed but the image capture command would try and capture page 3.

- **Case 16033**

In version 9.4 and 9.4.1 of T/HIS the FAST-TCF CSV2 command was not translated correctly when used with a single curve (the fault did not occur when groups of curves were processed). This has been fixed.

- **Case 16012**

In some cases a FAST-TCF script generated from within T/HIS would not contain all of the commands needed to regenerate a plot successfully. Typically the bug would show up in the script as a reference to a non-existent curve with a tag of 'curve_0'. This bug has been fixed.

- **Case 16008**

In version 9.4 and 9.4.1 of T/HIS, a FAST-TCF script created by T/HIS would not always contain the correct options for automatically regularising curves before filtering them. In T/HIS the default when

working interactively is to regularise a curve before filtering. If a FAST-TCF script was captured from within T/HIS then the automatic regularisation option would often be turned off in the script by mistake. This would result in a different curve being generated by the filtering operation.

This has been fixed in 9.4.2 onwards.

- **Case 15455**

The example command for setting fonts in the FAST-TCF section of the manual was wrong as it didn't include the colour definition that is expected as the 4th argument to the 'fonts' keyword. The example has been changed and the table of options updated.

Graphics

- **Case 15248**

If the 2 thickest lines widths were used for curves and a dashed line style was selected then after apply these settings the axis borders and grid lines could be drawn using a thicker line than expected.

This has been fixed in 9.4.2.

Groups

- **Case 15578**

If a T/HIS group file was read in twice then some of the Part Group definitions could become corrupted the second time the file was read. This has been fixed.

Menus

- **Case 15842**

If the curve manager was undocked and the user toggled between multiple graphs using the G1/G2/G3 etc switches, the curve manager did not update until you clicked on it.

It now updates as soon as the G1/G2/G3 etc switches are pressed.

Operations

- **Case 15976**

In some cases T/HIS could crash when filtering curves, if the filtering was the first operation carried out after reading in data.

- **Case 15818**

If the 'Map' operation was used before any other operation, T/His could crash. Fixed now.

Quick pick

- **Case 15995**

When using Quick Pick T/HIS would always select the curve with the lower ID if there were 2 curves on top of each other at the pick location. As the curves were drawn in order of ID then the curve with the higher ID would be drawn last and be visible and Quick Pick would appear to select the wrong curve. Version 9.4.2 has been modified so that when there are 2 or more identical curves the curve with the highest ID is now selected by Quick Pick.

Read

- **Case 16093**

If a filename starting with either a 'q' or 'Q' was specified on the command line then T/HIS would fail to open the file.

This problem has been fixed in 9.4.2.

- **Case 16047**

If a curve file was specified on the command line or if a curve file was clicked on and opened with T/HIS, the file was read correctly but the graph wasn't updated to show the curves until the user pressed PLOT. T/HIS now automatically plots any curves read in this way.

- **Case 15942**

T/His could sometimes fail to read a SSSTAT ascii file. This was because it was searching for the string ' dt of cycle', but in some files this was ' time step'. It now searches for both these strings.

- **Case 15737**

Reading a curve file could crash T/HIS if the file ended with a CONTINUE line. (CONTINUE is supposed to indicate that more curve data follows).

This has been fixed in 9.4.2

- **Case 15293**

If the option to read multiple ISO curves was used then T/HIS could crash if there were more than 100 channels defined in the ISO channel file.

The crash was caused by T/HIS expecting the file extensions to be

.0001, .0002...

not

.001, .002

If the files are renamed then the files will read correctly into version 9.4.1.

This has been fixed in 9.4.2.

- **Case 15019**

T/HIS 9.4 and 9.4.1 would crash if an ISO format curve file was read which contained a 'Sampling Rate' line but the sampling rate was actually defined on the line. T/HIS 9.4.2 will now detect this and issue an error message and use a sampling rate of 1.0.

T/his link

- **Case 16020**

If the option to undock the T/HIS curve menu was used in the D3PLOT->T/HIS link then the curve menu was mapped half underneath the main docked menus. This has been changed in version 9.4.2 so that the menu appear on top.

- **Case 15032**

When using the D3PLOT->T/HIS link and closing T/HIS, the D3PLOT graphics windows would not automatically resize themselves to fill the screen again. This has been fixed in 9.4.2.

User interface

- **Case 15078**

The Help text when reading in LS-DYNA files has been modified to make it clearer that the user can select any LS-DYNA results file and T/HIS will then find and open all the files for that model. The help has also been changed so that it also explains that if the user is using the default LSTC filenames (d3thdt, xtfile etc) then the default filenames that T/HIS searches for can be changed using a preference option.

Write

- **Case 15687**

If a wildcard was used to specify the list of curves written to a file then the wildcard would only work if there was nothing after the wildcard in the pattern that had to be matched.

bb_* would work,
*_bb wouldn't work
bb_*_ff wouldn't work

This has been fixed.

2.3.2 Bugs Fixed in 9.4.1

Data access

- **Case 14606**

T/HIS could return a PEMAG value of >1E+18 if a material did not have a Poissons ratio or Young's modulus defined in the ztf file, e.g. *MAT_HYSTERETIC_SOIL.

T/HIS now returns a value of 0.0 and issues a warning to the user.

Error trapping

- **Case 14695**

If a 'start_in' directory was specified in the 'oa_pref' file and it was overwritten by one specified on the command line then an ERROR message was generated. This has been changed to a warning message as the ERROR message could confuse REPORTER.

- **Case 14680**

When the option to automatically extract results was used in 9.4 the following error message would be displayed by mistake.

```
%%% ERROR %%%
```

Couldn't remove fasttcf report file

This message could be ignored. It has been removed for 9.4.1

FAST-TCF

- **Case 14962**

If in 9.4 a FAST-TCF script was run where multiple CSV files were output then on some platforms some of the CSV files would not be generated if the filenames were specified using a leading './'. If for example the FAST-TCF script containing the following

```
csv2 ./beams/otpt_1.csv as_1000 ss_1000 as_1000 auto
csv2 ./beams/otpt_2.csv as_1001 ss_1001 as_1001 auto
csv2 ./beams/otpt_3.csv as_1002 ss_1002 as_1002 auto
csv2 ./beams/otpt_4.csv as_1003 ss_1003 as_1003 auto
```

was run then only the 1st and 3rd output files would be created.

Menus

- **Case 14844**

In version 9.4 the popup menu for selecting the border thickness in the new 'Curve Properties' Format menu contained an additional button labelled 'Copy' that shouldn't have been displayed. This has been removed in 9.4.1.

The 'Visible' button in the 'Curve Properties' menu has been relabelled as 'Pick Visible' to make its functionality clearer in 9.4.1.

Properties

- **Case 14935**

The legend ymax and average value tick boxes in the curve properties popup could not be turned off if accessed by right clicking on a curve.

Read

- **Case 14883**

The option to 'Extract curves to match model: ' has been disabled in 9.4.1 if the user used the option to search directories recursively to open multiple models as it would only extract the curves for the last model that was opened.

This option will be fixed in version 10.0 so that it works when opening multiple models.

- **Case 14727 and 14714**

The ISO channel data reader would not cope with some files in ISO 13499 or ISO 6487 format. Both formats should now read in correctly.

- **Case 13058**

The reading of JNTFORC data from the binout and ASCII files has been modified in 9.4.1 and T/HIS now supports the *CONSTRAINED_JOINT_STIFFNESS_TRANSLATION joint type. The T/HIS manual shipped with the 9.4.1 software has been updated to show these new data components and how to access these via FAST-TCF.

In 9.4 the joint types in the LSDA file were incorrectly translated. Translational stiffness joints were translated as Generalised joints, while both the Generalised and Flexion Torsion joints were translated as Flexion Torsion joints.
Due to a bug in the LSDA file produced by SMP versions of LS-DYNA before 971 R5 it is not possible for T/HIS to tell the difference between a Generalised and a Flexion Torsion joint when reading data from the LSDA file. If you are using a SMP version of LS-DYNA prior to 971R5 then all of these joints will be displayed as Flexion Torsion joints. If you read joint data form the ASCII JNTFORC file then the joint types will be displayed correctly.

Due to these changes it is possible that a FAST-TCF script that ran successfully in version 9.4 might not work in 9.4.1 as a joint that was previously read as a Generalised joint will now be read as a Translational joint and the component names will not match.

Shortcut

- **Case 14533**

If in version 9.4 a shortcut action was assigned to the F1 key then pressing SHIFT or CTRL in the main right hand menu would also apply the shortcut action.

T/HIS Link

- **Case 14735**

If when running the D3PLOT->T/HIS link a 'Display Unit' was set in T/HIS which used a different time unit to the original model then the timeline would not work correctly.

Units

- **Case 14886**

In 9.4 if a curve was read in from an external source (T/HIS curve file) which has a unit system defined and the unit system was not the same as the current display unit system then the curve values would not be converted to the display unit system. If the display unit system was not defined when the curves were read in and was set after the curves had been read then the scale factors were not applied.

- **Case 14874**

If in 9.4 curves were read in from a model before a model unit system had been defined for the model then the curve unit system would not be set correctly when a model unit system was defined.

- **Case 14783**

If a user defined unit label was defined then the axis unit labels for each curve that used any other unit type would get set to nothing. Typically this problem would show up by the unit labels on axis disappearing as none of the curves being plotted had any unit labels defined for that axis.

User Interface

- **Case 14895**

For some axis ranges the coordinate feedback at the top of the T/HIS wouldn't show enough decimal places to make it clear what the cursor location was.

Write

- **Case 14567**

If a CSV file was written out using the X,Y,Y,Y format and the X-axis values were taken from a curve then some of the points for curves with a larger X-axis interval might not be written out to the file. This would only happen if the curve used for the X-axis values had 2 or more points between the 1st and 2nd points of the other curves.

If for example the X-axis curve had points at 0,1,2,3,4... and one of the other curves had points as 0,3,6 then values would not be written out at x=2.

2.3.3 Bugs Fixed in 9.4

Data access

- **Case 14059**

In version 9.3 and 9.3.1 T/HIS would read data incorrectly from the BINOUT (LSDA) file for shell elements with 3 and 5 integration points if the surface was set to either bottom or middle. T/HIS assumed that for all shells the integration points were written out in order from bottom -> top. For 3 and 5 integration points this isn't true and they are written in the order

3 : Middle, Bottom, Top
5 : Middle, Bottom, Bottom+1, Top-1, Top

This meant that if you asked for 'Bottom' you would actually get the 'Middle' results and if you asked for 'Middle' you would get 'Bottom' (3) or 'Bottom-1' (5). 'Top' would always give you the correct result.
The bug affected only data from the BINOUT file, not the THF (d3hsp) file.

- **Case 13927**

When the option to specify a filename prefix (using *KEYWORD_ID or jobid=prefix) was used, T/HIS 9.3 and 9.3.1 would only find the first binout (LSDA) file prefix.binout0000, but not subsequent family members prefix.binout0001 etc. Workaround: If the files were renamed from

prefix.binout0000 -> binout0000
prefix.binout0001 -> binout0001
...

then T/HIS would find all the binout files correctly.

- **Case 13818**

Version 9.3 and 9.3.1 of T/HIS would fail to read the SSSTAT ASCII file produced by some versions of LS-DYNA correctly. This problem was caused by a change to the format LS-DYNA uses to write the subsystem ID's to the file. Version 9.4 of T/HIS can now read both formats.

- **Case 13476**

If curves were read in from a BDF file (T/HIS bulk data file) after other curves had been created in T/HIS, then the properties for the curves in the BDF file (min, max etc) would not be calculated. This meant that plots using these curves would not be autoscaled correctly.

- **Case 13209**

In T/HIS 9.3 and 9.3.1 the results for nodal reaction force groups were not read correctly from the XTF file if multiple components were selected in one read operation. If components were selected one at a time, or if the reaction forces for groups were read from the NODFOR or BINOUT files, then they would be read correctly.

FAST-TCF

- **Case 14449**

The FAST-TCF function that returned an average value for a curve (or part of a curve) could give the wrong value if the start and end values didn't match the x axis values exactly. The function has been re-written so that it now interpolates correctly between points if it has to.

- **Case 13968**

If a FAST_TCF script that creates multiple pages is replayed, then at the end of the playback the currently active graph might not be on the current page. If a command to change the appearance of a graph is then carried out (i.e. change background colour) it appears as though nothing has

happened as the only graph that is updated is not visible. From version 9.4 onwards T/HIS adds an additional line to any FAST-TCF scripts it generates that makes all graphs active again.

- **Case 13871**

If a T/HIS object was re-captured in REPORTER then any image output commands in the original script that were not using the 'bmp' output format were changed back to 'bmp', while the filename was left with its original extension.

When the T/HIS object was generated with the new script, the file would be named something like 'image.jpg' even though it was actually a 'bmp' file. REPORTER would then complain that the file was either an 'unsupported format or corrupt'.

This has been fixed in version 9.4 by stopping T/HIS changing the output filetype back to BMP.

- **Case 13658**

If a FAST-TCF script was run multiple times and the script contained commands to create a curve group, then each time the script was run a group with the same name would be created. When the group was referenced in the rest of the script, the1st group with the name would always be used. From version 9.4 onwards a check is now carried out whenever a curve group is created in a FAST-TCF script to see if a group with the same name already exists. If an existing group with the same name is found then the old group is automatically renamed by appending '_old_n' to it where 'n' starts at 1 and is increased until a unique name is generated.

- **Case 13496**

The FAST-TCF command to show the minimum y value of a curve 'show ymin on' did not work. The commands to show the max/min values and injury criteria values have been replaced with a new 'properties' command.

- **Case 13424**

T/HIS 9.3 and 9.3.1 could get stuck in an infinite loop if a curve file was read in via a FAST-TCF script after the 'reset1' command had been used.

- **Case 13391**

In version 9.3 and 9.3.1 of T/HIS a FAST-TCF script would not be generated correctly if one of the curves selected for output had been copied to a new place on the ‘Curve Manager’ menu using the COPY and INSERT options.

- **Case 13356**

T/HIS 9.3 and 9.3.1 could crash when reading in a T/HIS curve file containing more than 10 curves via FAST-TCF.

- **Case 13256**

In T/HIS 9.3 the y-axis label would not appear in an image generated using a FAST-TCF script if the script was replayed using the '-batch' option on Windows and the image was generated using the default screen resolution. If the image resolution was changed to 2X or 4X the screen resolution then the label would be displayed correctly.

- **Case 13170**

The status of the auto regularise button and the dt interval were not being recorded in a FAST-TCF script for the C60-C1000, Butterworth, FIR and FFT functions.

- **Case 13164**

In version 9.3 and 9.3.1 of T/HIS, FAST-TCF scripts were not written correctly for FFT curve operations as the option to select between output of magnitude/phase or the real/imaginary parts was not stored.

Image

- **Case 13438**

T/HIS 9.4 has been modified so that on Windows, images are now captured from an image that has been built up in memory instead of directly from the screen. This means that it is now possible to move Windows from other programs in front of the T/HIS window while an image is being captured without the image getting corrupted. This feature has also been added to D3PLOT and PRIMER.

Menus

- **Case 14220**

If in version 9.3 or 9.3.1 after swapping the Style menu to either 'Show Models' or 'Show Groups' the menu was called up again by clicking on one of the curve style buttons in the Curve menu, the menu would come up still in ‘Show Models’ or ‘Show Groups’ mode. This could be confusing so version 9.4 has been changed so that if the menu is displayed via a curve button then it swaps back to 'Show Curves'.

- **Case 14219**

In versions 9.3 and 9.3.1 of T/HIS the 'Select All' and 'Deselect All' buttons in the Style menu would change the background colour of all the curve style buttons to black.

- **Case 13875**

In versions 9.3 and 9.3.1 of T/HIS and D3PLOT the menu box displaying ‘Help’ text would not be displayed if the environment variable 'MENU_AUTO_CONFIRM' was set to true. Version 9.4 has been modified so that this environment variable no longer affects 'Help' messages.

A new option has also been added to all of the programs that allows 'MENU_AUTO_CONFIRM' to be set interactively within a session. This option can be found in the 'Menu Attributes' menu.

Operations

- **Case 7947 and 6299**

A bug was logged stating that the T/HIS Butterworth filters did not produce the theoretically-expected transfer functions. This is a consequence of the special treatment used to eliminate phase lag and reduce end-effects. To satisfy users wanting a filter that matches theory, a ‘Pure Butterworth’ filter has been added to T/HIS. This is a 'textbook' implementation with no correction for phase or end-effects.

Preferences

- **Case 14013**

If the foreground and background colours are the same after processing all the oa_pref files an error message is now generated and the colour of one of them is modified. If the user has explicitly set the foreground colour then the background colour is changed, otherwise the foreground colour is changed.

- **Case 13731**

T/His could crash if the directory of the 'start_in' preference did not exist.

- **Case 12675**

In version 9.3 of T/HIS the preference file contained an example for specifying the macro directory that contained an environment variable.

this*macro_directory: $OASYS/this_library/macros

This wouldn't have worked as T/HIS would not have expanded the $OASYS correctly.

The directory path can now contain any environment variable.

Read

- **Case 14411**

If a CSV file was read using the X,Y,Y,Y,Y option and the column of X values had more points then any of the Y columns,

1,1,2,2
2,1,2,2
3,1,2,2
4,1,2,2
5,,,
6,,,

then T/HIS would add points with the same value as the X axis to the end of the last curve. It would add 1 additional point for each X value that didn't have any Y values defined.

- **Case 13922**

In versions 9.3 and 9.3.1 of T/HIS the values read from the ASCII JNTFORC file for the Beta and Gamma angles for stiffness flexion torsion joints were swapped round.

If the values were read from the BINOUT (LSDA) file then the correct values were read in 9.3 and 9.3.1.

T/HIS link

- **Case 14260**

If in the D3PLOT->T/HIS link a number of XY DATA curves were sent from D3PLOT to T/HIS and the total number of curves in T/HIS went past a multiple of 100 curves then the T/HIS curve manager would not update the number of curves displayed properly.

- **Case 12520**

In version 9.3 of D3PLOT and T/HIS the ID's of rigidwalls could be different in D3PLOT and T/HIS as T/HIS would use the ID's from the LSDA file while D3PLOT would number the rigidwalls 1->n. This would stop the user being able to either pick the rigidwalls interactively or to use the 'locate' option to find them.

This has been changed in version 9.4 so that consistent ID's are used when the T/HIS link is running.

Units

- **Case 13527**

In T/HIS 9.3 and 9.3.1 the scaling factors applied to axes were written incorrectly so, if interpreted literally, would be wrong by a factor of 10. If the axis multiplier should have been 1000 then it was being written as x10E+3 (10,000) not x1E+3.

User interface

- **Case 14489**

If a curve group was used as input to a curve operation then after the curve operation had completed the group would still be selected even though it's entry in the menu would appear blue (unselected). Clicking on the group again would then deselect the group instead of selecting it.
Case 14431
Version 9.3 and 9.3.1 of T/HIS would ignore the 'placement' preference option.

2.4 Oasys Reporter

2.4.1 Bugs Fixed in 9.4.2

User interface

- **Case 15133**

If you inserted a normal program into a template by selecting the program tool and dragging an area Reporter would think that the object was a library program, not a 'normal' program. This is now fixed.

Utilities

- **Case 15441**

Textboxes were not copied to the new page when using Page->duplicate. This has been corrected.

Write

- **Case 15786**

Hyperlinks in auto-tables could be incorrect when written to a PDF file. This has been corrected.

2.4.2 Bugs Fixed in 9.4

Generate

- **Case 9510**

Now that D3PLOT and T/HIS can capture images without windows being shown on Windows, REPORTER can now run them in the same way. Now, generating a report in batch mode uses D3PLOT and T/HIS silently.

HTML

- **Case 13846**

HTML output has been improved for tables. Previously cell heights could be too high on Internet Explorer and additionally text that was too big for a cell was not cropped.

Hyperlink

- **Case 13836**

Clicking on a hyperlink that referred to a non-existent report could crash Reporter. A warning box is now mapped if the report does not exist.

- **Case 13827**

The Hyperlink dock box was not mapped correctly when a hyperlink was clicked. A similar problem occurred with the 'master page' dock box.

PDF

- **Case 13883**

PDF output for table cells was not cropped if it was too large for the cell.

PowerPoint

- **Case 13874**

When writing PowerPoint output blank table cells were given the default font size by PowerPoint. As this is very large it caused the table row to be larger.

- **Case 13873**

PowerPoint output could sometimes only be done once for each Reporter session.

Printing

- **Case 13887**

Page ranges set by the user in the printer dialog were ignored and the whole report was printed.

Scripting

- **Case 14268**

The library script data_file_from_csv.js would not work correctly if the csv file did not have commas on the end of the lines.

User interface

- **Case 13960**

If you modified an items outline, fill or text colour or modified its line thickness or style this did not flag the template as requiring a save. Additionally templates which require saving are now marked with a * in the window title.

- **Case 12777**

When Reporter is writing a PowerPoint file you cannot use PowerPoint to edit another presentation or Reporter will stop writing the file, leaving an unfinished presentation. This is a known limitation.

Variables

- **Case 14347**

Reporter could crash when accessing variables after using the JavaScript method Template.GetVariableValue() with a variable name that did not exist in the template.

- **Case 14329**

If a job file was selected before doing a capture for a T/HIS object REPORTER would not try to substitute DEFAULT_DIR (and other variables) in the filename.

- **Case 13833**

If you edited an existing FAST-TCF object that used variables somewhere in the script and you pressed capture to change the script REPORTER prompted you to try to replace text with variables in the new script but no replacements were done.

2.5 Oasys Shell

2.5.1 Bugs Fixed in 9.4.2

Process

- **Case 15918**

In version 9.4 and 9.4.1 the 'oasys.submit', 'oasys_utilites' and 'oasys_queue' files were not released once the Shell had finished reading them and would only be released when the Shell exited. In version 9.4.2 onwards these files are released as soon as the Shell has finished with them.

- **Case 15327**

If a Reporter job was set up to run automatically after an LS-DYNA analysis using the Shell, and if the template file was selected using the file selector button, then the analysis might not run. Fixed now.

Restart

- **Case 15303**

The shell would fail to find restart files on some platforms if they were >2GB. This has been fixed.

2.5.2 Bugs Fixed in 9.4

General

- **Case 14242**

If you ran a model with LSTC output filenames and then tried to rerun it the Shell wouldn't ask whether you wanted to overwrite or delete the existing files. By default it would overwrite them. Now the user gets a choice.

Menus

- **Case 14026**

The button that displays the file format (ARUP/LSTC) disappeared if a model with *KEYWORD_ID was selected. The file prefix defined in the key file should have been shown.

- **Case 9581**

The SHELL would crash if you opened the Preference editor, closed it using the 'X' in the top right hand corner of the window and then tried to reopen it.

Multiple jobs

- **Case 14110**

REPORTER would always run in batch mode if started after an analysis from the Submission panel, even if the user switched it off in the REPORTER options panel.

This has been changed so that it can now be set on or off and if the submission type is ONLINE the option selected by the user is used. For any of the other submission types REPORTER will still be

run in batch mode, irrespective of the users' selection.

A switch has also been added in to control whether or not to automatically exit REPORTER after it has run.

Turning the two options off should aid debugging if a process falls over.

Output

- **Case 13734**

In version 9.3 and 9.3.1 of the SHELL the options for outputting data to the FSIFORC file was not written correctly to the 'names' file.

User interface

- **Case 12486**

Entries in the 'oasys_utilities' file were limited to 20 characters. This has been increased to 40 characters.

3 Enhancements

The enhancements and bug-fixes for each program have been broken down into a series of topics. Within each topic enhancements and bug-fixes are listed by case ID (most recent first).

3.1 Oasys PRIMER

3.1.1 Enhancements in 9.4.2

Seatsquash

- **Case 15081**

Improvements to how spotwelds are handled during a rigidify operation:

- For the case of meshed in spotweld beams, the beam is only deleted if the nodes at both end are flagged for rigidification. Previously it was just one.

- For spotwelds tied with contacts, previously the connection was removed if a shell at either end was being rigidified to avoid constraint clashes due to tied contacts. Now, Primer will only delete the connection if all shells it attaches to are rigidified. If only some shells are rigidified then primer will look to see if the connection is attached via a constraint contact. If so, the nodes will be removed from the previous contact and attached via a new penalty based contact. This is consistent with the connection contact creation/fixing feature.

3.1.2 Enhancements in 9.4

Adhesive

- **Case 12460**

Adhesives can now be created along a free edge. This is done by picking start and end nodes along the free edge.

Attached

- **Case 12601**

A new shortcut operation has been added. Pressing 'j' (by default) will apply the 'find attached' operation.

- **Case 12190**

Added to 'Attached' tool the ability to select the 'seed' entities, rather than using visible entities.

- **Case 12061**

A popup has been added to the 'Constrained' option (this only appears if there are *CONSTRAINED entities in the model) on the Attached panel. This opens up a separate panel which allows the user to select/deselect different *CONSTRAINED types for the Attached process. Previously you could find attached only through ALL constrained types.

Belts

- **Case 12658**

It has long been a criticism of the seatbelt fitter in PRIMER that no control is provided over the twist of the basic path, and that the twist angle chosen by the code can sometimes be wrong in areas of difficult geometry.

It is now possible to control the twist of each basic path point, using 'handles' on the belt path to

drag its twist angle interactively.

In addition, the automatic choice of initial twist angle at belt ends and at the slipring locations has been improved.

- **Case 11214**

During seatbelt fitting the nodes selected for basic path points are now 'remembered', and will be used in the meshing phase to locate sliprings/retractors or fixed ends.

- **Case 9607**

A request has been made to modify the shape of an existing seatbelt by dragging its path to a new location, and then to refit it to the dummy.

This can be done so long as the belt was originally created in PRIMER, and there is a 'path' definition.

By entering the path editor ('fit' mode) the path as whole can be dragged or individual points can be moved using left, middle and right mouse buttons for X, Y and Z directions. The existing “modify” button has been changed to “Modify coords” to distinguish it from the new “modify twist” capability.

Subsequently either 'mesh', which will blow away the old definition completely and create a new one, or 'auto-refit', which will try to refit the existing definition, may be used to re-tension the belt.

- **Case 8364**

The contact between seatbelt and dummy that can (optionally) be created during belt fitting sets up default contact properties, but these can sometimes be inadequate if the stiffness properties (moduli) of the belt and occupant are wildly different.

Setting 'soft = 1' on the contact surface definition can solve many of these problems because it scales contact stiffnesses as required, and this is now the default for contacts created in this way.

- **Case 8053**

The seatbelt fitter has been improved to address some ergonomic issues that have been criticised in the past, in particular:

Definition of the basic belt path is now much easier because the visualisation of the path that will be created is now shown immediately at all stages of basic path creation.

Acute angles in the basic path are now detected and 'fixed' automatically, and it is possible to define sliprings and retractors at the basic path creation stage.

The geometry of the basic path has been improved to take into account subsequent meshing with 2D belt elements, with the mesh being continuous through sliprings.

The belt path in straight sections now achieves the 'straight line' shape that the user would expect in these regions.

In the meshing stage sliprings and retractors defined in the basic path are created automatically.

- **Case 8040**

PRIMER's seatbelt fitter has been revised to build its basic path on the assumption that 2D shell or seatbelt elements may be used throughout the eventual mesh, including at sliprings and retractors.

Mesh is continuous through sliprings, and the geometry at the shoulder slipring is now more realistic.

Meshing can be carried out in any permutation of 1D belt elements, 2D belt(shell) elements, conventional shells, mixed 1D belts + shells or mixed 2D belts + shells.

When 2D belt elements are used the various sets required at sliprings, retractors and on the section card are all generated.

- **Case 7332**

Prior to release 9.4 PRIMER 'Belt' definitions did not include sliprings or retractors, meaning that deleting a belt could leave these (plus the elements attached to them) behind. Manual belt remeshing could also do much the same thing, ignoring any existing sliprings or retractors.

In 9.4 this problem has been addressed, and a 'belt' definition now detects any sliprings or retractors attached to the belt elements and includes them. Therefore they no longer become orphans and are dealt with in a much more consistent manner.

Checking

- **Case 13652**

A new check has been added to warn if *LOAD, *BOUNDARY_SPC, *BOUNDARY_PRESCRIBED_MOTION or *ELEMENT_MASS are applied to a node which is non-structural or only used as third node of a beam.

- **Case 13620**

The NCPU option in *CONTROL_PARALLEL is no longer recommended. Consequently, PRIMER issues a warning if this option is used.

- **Case 13580**

Added a check to tell the user if a section shell card is used with MAT34 where B1 and B2 on the section card are co-linear.

- **Case 13300**

A generic check on tables of curves used for materials which have units of stress:strain to report a warning if the curves cross one another has been added. This check excludes MAT24/MAT124 which are checked instead under the material category check.

- **Case 13298**

Added a new error check that ensures that parameter LFED on *ELEMENT_RETRACTOR is less than or equal to 3x the LMIN value defined on the *MAT_SEATBELT of the ‘mouth’ seatbelt element.

- **Case 13244**

If joints have been defined with an incorrect nodal order, a check and autofix have been added to correct this.

- **Case 12858**

A new check has been added for skew of tetrahedron elements. These are considered skewed if node 4 does not project onto the opposing face.

- **Case 12829**

Added a warning for single strips of type 2 quad shell elements, which can be unstable.

- **Case 10939**

PRIMER issues an error message if a seatbelt retractor has no minimum tension (when Y value at origin of loadcurve is less than or equal to 0.0).

- **Case 10592**

PRIMER issues an error message if the model contains type 16 shells and *CONTROL_BULK_VISCOSITY => TYPE is not -1 or -2.

Coating

- **Case 12445**

PRIMER now permits users to select a shell as the seed for the 'Face' mode in the Coat function. Also, a solid face can now be directly picked as the seed. Users no longer have to pick a pair of nodes to help identify a seed face in cases of solids with multiple external faces.

Connections

- **Case 13987**

You can now specify a master part or part set when using the auto-spotweld creation feature. If specified, only free edges on the master part/part set are used to create spotweld runs.

- **Case 13532**

Logic has been added to update the appropriate connection layer information if the PID1/PID2 fields are modified on a *ELEMENT_BEAM edit panel. PRIMER will now:
Find the appropriate layer and update it to reference the
new PID typed into the beam edit panel.

If the layer modified is not at the end of a chain
of welds in a 3T+ weld, the appropriate PID1/PID2
fields are also updated on other beams in the connection.

- **Case 13035**

The ability to easily move multiple connections to a chosen include file through the connections table has been added. This is done by selecting the connections you wish to move, then right clicking on a selected field under the column 'conx include'. Choose the 'Change include' button on the popup to bring up the standard include selection panel.

- **Case 12749**

The ability to create PRIMER adhesive connection data from solid element runs has been added (Connection => FromFE menu). This is able to convert regular runs of solids into PRIMER adhesive connection types.

- **Case 12742**

Selection of connections 'by spotweld beam' and 'by spotweld solid' has been improved by restricting beams and solids displayed to those with cross-reference to a spotweld. The list of parts in 'by panel' mode is now restricted to parts which serve as connection layers.

- **Case 12719**

Optional titles can be added to connection entities when reading in connection/spotweld files or creating new connections/spotwelds. This aids in being able to group connections together. Connections can now also be chosen for opening on the part table by the connection title.

- **Case 12627**

Spotweld merge function has been improved. Un-made spotwelds may now be merged, previously the function only merged 'realized' welds. If welds to merge appear to be too far apart, PRIMER will now offer the option of continuing with the merge and ignoring the 'min dist' parameter.
Case 12595
Added the ability to create MIG spotweld connections along a free edge between two chosen nodes.

- **Case 12427**

Connections are now available (under the bolt option) which create and connect two rigid patches using ball or revolute joint.
Two-ended bolts are now available. The user specifies two points, each of which is connected to the surrounding elements via rigid patches or nodal rigid bodies; the two points may be connected by a deformable beam element. This connection type stores two sets of XYZ coordinates.

- **Case 12132**

Customers with very large models have reported that the connection table takes an excessively long time to bring up. This is because the contact checking necessary to ensure that all are tied is very intensive, particularly if multiple spotweld contacts are defined.
To assist in these circumstances an option has been added 'postpone connectivity check for table'. If active, the table should appear near instantly even on large models as only basic geometry checks are performed.

- **Case 11894**

An option to leave the FE data when deleting a connection entity through Connection->Delete has been added.

- **Case 11803**

PRIMER now supports creation of bolts/joints at the centre of a hole.

- **Case 11564**

The ability to modify the pitch of spotweld lines has been added. Also, the ability to convert spotweld lines to adhesive runs, and vice-versa has been added.

- **Case 10347**

An option has been added to the connection create panel so that when creating spotwelds by lines, the resulting connection point is placed at the average coordinate of the spotweld.

Contacts

- **Case 12624**

On contact cards you can specify user thickness (SST/MST) of -X which means use X and do not bother with the possible tolerance increase due to large segment diagonal i.e. it may reduce number of tied nodes.

This is now supported in PRIMER.

- **Case 12489**

The penetration checking of contacts has been speeded up by threading (parallelising) it over the machine's processors.

For a typical large contact the speed-up on two processors seems to be of the order of 40%, hopefully machines with more cores/processors will do better still.

Cut section

- **Case 12516**

In the Cut-Sections panel the '2D polygon capping' option determines what visual thickness is used for the display of cut shells.

A new 'Use *PART_CONTACT values' option has been added which for shells using the *PART_CONTACT option will use:

Thickness OPTT if this is defined.
or
True thickness times SFT if that is defined.
or
True thickness if neither defined.

Shells not in a *PART_CONTACT definition will use their (unscaled) true thickness.

Database

- **Case 13768**

Modifications to sketching on the database x-section edit panel. The cross sections are now sketched with arrows to indicate the '+ve' direction.

Entities cut by the x-section are now drawn in bold.

- **Case 13371**

The *DATABASE_CROSS_SECTION editing panel now contains a new option to automatically create a local coordinate system (with parameter set to '2') for cross-section planes created in the model.

- **Case 13307**

Added a 'Show only PSID' button to the DATABASE_CROSS_SECTION edit panel. This will redraw the graphics display to only show the part set used to define the cross section (if on is defined).

- **Case 12536**

*DATABASE_CROSS_SECTION: The Sketch function now includes arrows to show the plane local directions.

- **Case 12068**

An UNDO button is now available in the DATABASE_CROSS_SECTION editing panel that deletes cross-section planes created with 'AUTO_CREATE' switched on.

- **Case 11414**

*DATABASE_CROSS_SECTION:
It is now possible to create cross-section planes normal to a free edge or a feature line by simply clicking a node lying on the line/edge.
It is now possible to easily create a number of cross-section planes either along one of the global coordinate axes, or along a free edge/feature line. The new planes will be created with a user-specified offset between them, starting with an existing plane constructed at a picked node.

Dummies

- **Case 12602**

Recent encrypted input decks of FTSS dummies have altered their formats in two ways which made them difficult to read into PRIMER:
The title line for encrypted materials which was previously the plain material label now has a 'MATL' prefix. This could cause the material definition not to be read.
Some models contain encrypted *DEFINE_TABLE data, which earlier versions of PRIMER would not understand.
PRIMER release 9.4 now handles both these problems: it has a more flexible approach to reading material labels from their title lines, and it will accommodate encrypted tables.

In the case of tables encryption makes it impossible to tell how many loadcurves are included in the table, so all *DEFINE_CURVE definitions which follow an encrypted table are included until some different keyword is encountered. This may not be strictly correct, but it also will not matter so long as the dummy deck is considered as a self-consistent whole.
See also case 13225 under “Read”.

- **Case 12049**

A new command line option 'H_POINT' has been added to the /DUMMY menu. This allows a new H-POINT coordinate to be specified for a dummy, and will move the dummy as a whole to that location.

New command line options 'LOCK' and 'UNLOCK' have been added to the /MECHANISM, CONNECTION menus. These will lock and unlock the connection.
Further new command-line options to read and write configurations files (containing the restraint conditions of the assemblies) have been added – see User Manual for further details.
Case 8086
It is now possible to define contact between a dummy (or mechanism) assembly and 'structure' during positioning.

Contact is defined by specifying a part set of 'structure', delimited by an optional box.

During mechanism (but not pure dummy rotation) positioning contact is considered if this feature is switched on. (It is switchable because the calculation of contact slows down positioning.)

Contact is effectively 'rigid to rigid', so this process is suitable for preventing penetration, but it will not result in any deformation of either dummy or structure elements.

FMH

- **Case 13548**

For IHI auto-position, at the end of the process PRIMER now checks to see if the initial contact point is within the headform impact zone. The impact zone is defined by a node set, and is saved with the post *END headform keyword information. Also, a 'check' table has been added to the FMH positioner. When clicking on the check button PRIMER will do the following:
Go through all saved target points/positions.
For each one find the point of first contact with the trim.
From this, determine the distance between the point of first contact and the target point, and also if the contact point on the head is within a defined impact zone.
Plot this information (as well as other things) to a table.
Colour code some of the columns of the table to show if something is fails or passes (red or green) the test.

Graphics

- **Case 11296**

True sections of beams, and their orientations, can be displayed by turning on the option in the 'Display Options' menu. Sections not supported are still drawn as lines.

Image

- **Case 12158**

The background can be set to white when capturing images. Once the image is captured, the original background colour is restored.

Include

- **Case 13621**

PRIMER will now allow multiple include files under a single *INCLUDE keyword.
This works for
*INCLUDE
*INCLUDE_NASTRAN
*INCLUDE_PATH
*INCLUDE_TRANSFORM
*INCLUDE_COMPENSATION_xxxx
but not *INCLUDE_STAMPED_xxx as that has optional cards.

- **Case 12800**

Added the ability to see which include file each separate control card resides in and also to change the include file it resides in. The original logic remains (the ability to move ALL control cards into one include file). Also improved the 'locate' functionality of the clipboard so that control cards and database ascii/binary are listed with their full keyword names.

- **Case 12552**

A warning is now given when using 'Add new child' to add an include file if the file contains child includes as these will be skipped. The user is given the option of cancelling if required.

- **Case 9878**

PRIMER now allows users to overwrite existing ranges by importing data into the 'Include Renumbering' table in the form of a csv file.

Keyword

- **Case 12265**

The *ELEMENT_SEATBELT_SLIPRING editing panel has been updated to support one-way slip-rings. Parameters <FC> and <FCS> in the same editing panels can now be negative, in which case, they are defined as load-curves.

- **Case 12062**

An 'annotate' button has been added to the joint edit panel and the main joint panel. This allows the user to display node and rigid body labels to the screen to more clearly see the construction of the joint.

- **Case 4645**

*PART_MOVE cards are now shown in their translated position
(No case)
Primer 9.4 has been updated for compatibility with LS971 R4.2.1 (keywords shown in the June 2009 Keyword manual).

Kwd editor

- **Case 7522**

Materials (and thermal materials and equations of state cards) now have a 'Keyword' button to invoke the generic keyword editor for these types.

In the case of *MAT the list of suffices, i.e. material types, is limited to only those currently in the model, since otherwise the list just becomes ridiculously long and the popup menus huge as a consequence. This means that new material types cannot be created ab initio in the keyword editor, but once a single such definition has been created (using CREATE or MODIFY) then it will appear in any subsequent keyword editor panel.

(Thermal materials and equations of state do not suffer from this limitation, since the limited number of sub-types of these keywords means that all can be shown without problems.)
Users may wish to use the Filter button to reduce the list of materials in the keyword editor to those of a single material type. The data may be easier to work with when the menu is switched to Single-row format.

Loadcurves

- **Case 13562**

When a loadcurve check detects that the X axis is not monotonically ascending in X it reports this, but does not state *where* the problem occurs. Finding this in a very large curve can be difficult!

This has now been updated: if 'details' of the check are requested the point numbers and their values are reported.

- **Case 8100**

Loadcurves can now be exported from PRIMER in CSV format through the loadcurve edit panel.

Mass

- **Case 13799**

Information on the ‘Part >Properties’ panel has been improved to report both pure structural mass and the sum of structural + non-structural mass, the latter being derived from non-structural mass on the section card and *ELEMENT_MASS_PART.

Materials

- **Case 12331**

Added field 'THKDIR' in *MAT_169. This field is written out for LS-DYNA version 971 R3 and above.
(No case)
Local axes of elements may now be displayed using the material axis system (taking into account orthotropic material input data using AOPT, element beta angles etc). For composites, the material angle at each integration point may be displayed.

Menus

- **Case 12468**

More row entries have been added to the Model->list panel, rather than being restricted to only 7 rows.

- **Case 10654**

The DOF field in the *BOUNDARY_PRESCRIBED_MOTION keyword editor now includes a text popup that provides a description of the various options.

Merge

- **Case 13408**

A default title is now given when merging models.

Mesh

- **Case 13259**

When offsetting shell elements using Tools->Mesh->offset, the option has been added so that the original shells can be retained in the offset position, rather than just having the option to create new shells in the offset position.

Model Build

- **Case 13780**

An oa_pref setting 'extensions_for_database_from_dir' has been added so that users can configure the extension(s) of files to be considered by the function which makes an xml database from the contents of a directory. The default is '.key;.k;.dyn'.

- **Case 13775**

'Model build from csv file' no longer aborts if the process fails for a particular load case. The process will continue and should any fail, the user will be presented with a list when the build has completed.

- **Case 12987**

The function which creates a database from directories now has the option for relative or absolute paths.

- **Case 12096**

A new 'Model build from csv file' type, PEDHEAD_ANGLE, is now included in PRIMER. This is similar to the PEDHEAD type but permits the specification of an approach angle for individual loadcases.

- **Case 11945**

PRIMER saves a temporary csv file prior to 'model build from csv' operations thus preserving any changes that users may have made.

- **Case 10848**

PRIMER now allows the specification of an offset distance while building models using csv files. In this case, the impactor will be moved back along the line of flight by a user-specified distance once the build operation is complete.

- **Case 7788**

PRIMER now includes a PEDLEG_LOWER type for automated model builds. The Z coordinate is specified globally for this type.

PEDLEG_UPPER is now available for positioning the upper legform.

Nastran

- **Case 13123**

The NASTRAN function which converts tied contacts to RBE2/RBE3 has been improved:
to allow definition of slave side by part or part- set (previously limited to node-set) and
to only tie those nodes which the contact checker reports as tied.

- **Case 13078**

The NASTRAN input translator now supports NASTRAN PBARL cards, and can translate them into DYNA sections of the following type:
SECTION_05
SECTION_08
SECTION_09
SECTION_11
SECTION_19

New feature

- **Case 11460 and 12273**

An optional 'timeouts' file may be specified in the (optional, new in 9.4) OA_ADMIN directory to control idle PRIMER and other Oasys software sessions.

The 'timeouts' file specifies an idle period and a grace period.

After the session has been idle for the specified time a message will pop up in its window stating that termination will occur after a further elapsed grace period if no activity occurs. The session is then killed if the user does not respond within that period.
(No Case)
Macros can be recorded and replayed.

Nodal Rigid Body

- **Case 13279**

'Add' and 'Remove' buttons have been added to the NRB edit panel when in modify mode for easy addition and removal of nodes from the NRB node set.

Orient

- **Case 13462**

Scale, reflect (-ve scale) as well as translate and rotate are now supported with a *INCLUDE_TRANSFORM option in the orient menu.

- **Case 12953**

Orient projection has been enhanced to allow projection along a vector specified by the user.

- **Case 12894**

Orient will now offer a warning if nodes of elements (shells, thick shells or solids) which are not themselves selected for orient are moved. The option is called 'distorted element warning' and may be switched off.

- **Case 12535**

Under orient options, 3 labelling methods are now offered for copy orient: highest label, first available label seeded up from given label, label offset by given value.

- **Case 11364**

A new option has been added to the orient function - 'Consider Include Transform'. PRIMER will inspect the nodes to be oriented, if it finds an include file where all nodes are selected it will offer the option of using *INCLUDE_TRANSFORM rather than explicit orient.

- **Case 11108**

When interpolate is active during orient, the button is now coloured red to alert the user.

- **Case 10059**

When you select an include file for orientation, you will now be offered the option of using *INCLUDE_TRANSFORM for the orient rather than explicit orientation.

Parameter

- **Case 13821 and 13800**

When a title string contains something that looks like a parameter, i.e. '&...', then the behaviour in LS-DYNA varies by version

LS971R4 will parse a parameter in a title string correctly if it is a genuine parameter, substituting the parameter value. If the string is not a parameter it generates an error message and terminates.

LS971R3 ignores these strings and simply reports them verbatim.

LS971R2 and earlier behave a bit like 971R4, but don't make a very good job of determining what is and is not a parameter. (Versions prior to LS970, in which the concept of parameters was unknown, just report title strings verbatim.)

To deal with this problem by default PRIMER acts as follows:

If a title string contains '&...' it checks to see if this string matches a known parameter. If it does then on keyword output:

In LS971R4 and later the string is output verbatim.
In earlier versions the numeric value of the parameter is substituted for keyout only.

If it does not match any parameter then, for all versions, the '&' character is replaced by a '@'. This prevents errors occurring on input into LS-DYNA.

This behaviour can be controlled by the ‘PRIMER*parameter_in_string’ preference, which has the options:

AUTOMATIC - default behaviour as described above.

REPLACE_AMPERSAND - unconditionally replaces the ampersand in text and title strings with '@'.

INSERT_VALUE - for defined parameters in text strings unconditionally replaces the parameter with its numeric value. If the '&...' string is not a parameter the '&' is replaced with '@'

VERBATIM - no change is made.

- **Case 13667**

When a model that uses parameters is subjected to a units change then an attempt is made to update the parameter values so that they remain consistent with the (changed) underlying values. This is done as follows:
In each instance where a value that references a parameter is changed then the parameter definition is notified of this change.
All parameter definitions are then scanned for changes, and any scale factors applying to them are reported.
This scale factor is then used to update each parameter's value. If there are conflicting factors (i.e. a parameter used in multiple contexts using different units) then the most recently encountered 'wins'.
The logic used to update parameters operates in several passes:
Scalar parameters are simply multiplied by the appropriate factors.
All parameter expressions are then re-evaluated using the (possibly) updated scalar parameter values. Since expressions may use other parameter expression values this process iterates until no further changes are found.
The resulting parameter expression values are then tested against 'original value * any units factor', and if this still differs then they are modified to give

multiplier * ()

so as to achieve the required value.
Finally all parameter expressions are re-evaluated (iteratively) once more to reflect any changes arising from step (3).
In a well-constructed model in which parameter usage is consistent with respect to the underlying units of values this should result in the associating between parameters and the data fields in which they are used remaining the same.

However if the changes applied above result in a disparity between the value of a data field and the parameter it references then PRIMER will remove this association.

- **Case 12781**

LS-DYNA 971R3 will apply parameters in the negative sense if the syntax '-&xxx' is used, so PRIMER has been updated to comply with this.

When output for versions prior to 971R3 is chosen a warning message is issued and the numerical equivalent of the -ve parameter value is written instead.

Part table

- **Case 13939**

Minimum timestep and minimum element size have been added to the part table. The latter uses the characteristic element size used to calculate the timestep.

- **Case 12656**

Parameters can now be displayed and modified on the part table.

- **Case 12107**

A basic find/replace operation for part titles has been added to the part table. This can be accessed through the ‘part title’ column pop-up.

Part replace

- **Case 12822**

Part Replace now offers option to re-attach entities that were connected to the old mesh,. Primer 9.4 finds the nearest node in the new mesh to merge nodes by distance. The node selection is configured by user's choice of options.

- **Case 12452 and 12822**

Part Replace now allows multiple parts to be replaced in a single operation. The Part IDs of the target and source parts must match. The parts may be selected as an Assembly.
The function has also been enhanced to handle more rigorously the re-attachment of items (such as Nodal Rigid Bodies, lumped masses, applied loads, initial velocities, etc) attached to the target (original) part, connecting them to the nearest nodes of the source (new) part. The items themselves may be sketched, and the nodes in old and new meshes displayed, prior to re-attachment.
Additionally, part properties (section, material) can be imported from the source part.
On completion of the operation, include file numbering ranges are applied if defined.

Part tree

- **Case 13541**

In PRIMER 9.4 the ‘Part Tree’ window can be undocked from its normal position in the menu system. It then becomes a floating window that can be resized and moved by dragging.

- **Case 13318**

An option has been added to the part tree to enable the 'Find' functionality to be case sensitive.

(No case)
A new button “contents” has been added. This changes the display to show all keywords rather than only parts. Further options are available to list, edit, blank/unblank the data shown. The Include button may be switched off, so that all the keywords in the model are listed and counted, rather than being subdivided by Include file.

Preferences

- **Case 13447**

There are several configuration options in the oa_pref file which are pathnames and/or filenames.

Historically PRIMER has read these verbatim, but has not expanded any environment variables within them which has prevented users from taking advantage of such variables.

Expansion now takes place, so the syntax:

%variable% (windows)
or
$variable or ${variable} (unix/linux)

within a string is expanded to its full extent.

- **Case 12430**

The requirement for a 'network preference file' is met by the addition of the OA_ADMIN directory in release 9.4.

- **Case 11261**

A new preference 'kzoom_factor' has been added for PRIMER to make the magnification factor of the '+'/'-' keyboard short-cuts configurable.

By default '+' will still magnify by 2.0 and '-' by 0.5, but a different value in the range 0.01 to 100.0 may be chosen.

By using 'PRIMER*kzoom_factor' this value will apply only to PRIMER, but if the syntax 'oasys*kzoom_factor' is used it will apply to all graphical Oasys Ltd software.
(No case)
Preferences may now be locked. The preference files are read in sequence from OA_ADMIN, OA_INSTALL, OA_HOME.

Quick pick

- **Case 12075**

Manipulation of data in *DATABASE_HISTORY was a bit crude, and in particular it was not possible to screen-pick these items or to add/remove multiple entries to/from blocks in a single operation.

*DATABASE_HISTORY entries can now be screen-picked in all object menu contexts, which also means that they can be screen-picked using 'quick pick' and from popup menus.

In addition 'Add...' and 'Remove...' functions have been added to the time history block editor, making it possible to process multiple entries in a single operation.

Read

- **Case 13946**

PRIMER will now store and write out the HM comment HWCOLOR.

- **Case 13520**

Added a new column to the part table - 'Stamped part'. This tells the user if a part is referenced in a *INCLUDE_STAMPED_PART definition. ‘Stamped part’ definitions can also be viewed in the part tree.

- **Case 13296**

The Read->View log text edit panel no longer blocks other operations in Primer.

- **Case 13225**

PRIMER 9.3.1 could handle the specific cases of PGP encrypted data within *MAT and *DEFINE_CURVE keywords, so long as a specific syntax was followed. However it could not handle randomly occurring blocks of encrypted data in a deck.

In release 9.4 this restriction is lifted and randomly occurring 'free standing' blocks of PGP encrypted data are now processed as follows:
During input they are copied verbatim to temporary 'saved pgp data' files. A separate file is used for the master deck and each include file.
During keyword output the contents of these files are copied verbatim as the last entry before *END in the relevant files.
This implies that free-standing encrypted data is both order and position independent within the input deck. (The position of the encrypted data within the deck is not 'remembered' on output.)

In cases where this order-independent 'free standing' logic is not valid users will need to encapsulate order-dependent encrypted data within one or more include files, and refer to them in the required order (and possibly position) from within the master deck.

- **Case 12717**

PRIMER now has the ability to read ANSA group comments can convert these to PRIMER assembly data. The user can also select to write PRIMER assembly data out as ANSA comments upon keyout.

- **Case 12681**

PRIMER will now convert HM assembly comments into PRIMER Assembly data. The user can also choose to write PRIMER assembly data as HM comments rather than PRIMER data.

Renumber

- **Case 13618**

Creation of nodes via 'nodes along line' etc. now uses the edit panel label method to assign the created node labels.

- **Case 13570**

*CONSTAINED_NODE_SET's are no longer considered in the 'general' include numbering range. They are now considered in the same way as nodes/elements/nrb's and node sets, which have a separate numbering range.

- **Case 13485**

During the automatic renumbering of discrete and seatbelt elements during a keyout, if the labels clash with beam elements, previously they would be relabelled to highest + 1, rather than attempting to relabel within any defined include range. .

- **Case 12514**

Negative label offset values can now be specified when renumbering using the 'Renumber selection' panel, renumbering through the clipboard, or entity creation due to a copy during an orient operation.

- **Case 10663**

PRIMER now permits users to protect entity labels that are used by *DATABASE_HISTORY cards during renumbering. Entity labels that lie within a user-specified range can now also be locked.

- **Case 10602**

A global preference has been added to allow the user to select the numbering method they wish to use when creating entities. The method for generating new labels is now consistent across PRIMER and will use INCL file ranges if these are present.

Rigid bodies

- **Case 13588**

Improvements to handling of *DEFORMABLE_TO_RIGID:
The master part (MRB) can now be a deformable part that is referenced on another deformable to rigid card for conversion to rigid.
An '_AUTOMATIC mode' button has been added to the deformable to rigid main panel to avoid confusion in where you create/edit the different types of this card.

Rigidify

- **Case 13261**

During a rigidify of shell elements, the user is now given the option of updating layer information for any connection that would be affected by the shells moving from a deformable part to a rigid part with a different part ID.

- **Case 12653**

A new 'simplify' option has been added to 'Rigidify'. Here the rigidified elements are deleted when replaced by a rigid part. A master rigid part is created with the mass and inertia properties of those elements removed.

Scripting

- **Case 14284**

A new option has been added to the ‘File’ class to create a temporary filename for writing a temporary file:
File.Mktemp()

- **Case 13477**

An extra argument has been added to javascript blanking functions to give the user control over redraws after the blanking has been applied.

- **Case 13468**

A Part.CentreOfGravity() method has been added to the scripting to get the CofG for a part.

- **Case 13412**

A new MilliSleep() function has been added to the JavaScript to enable users to pause scripts for fractions of a second.

- **Case 13365**

Properties 'filename' and 'path' have been added to the Model class in JavaScript to enable the user to get the name of the file read into PRIMER.

- **Case 13364 and 14283**

JavaScript support has been added for the following:
*CONSTRAINED_JOINT_option
*CONSTRAINED_EXTRA_NODES_option
*CONSTRAINED_RIGID_BODIES
*CONSTRAINED_NODE_SET_option
*CONSTRAINED_JOINT_STIFFNESS_option
*DEFINE_BOX
*INITIAL_VELOCITY
*INITIAL_VELOCITY_GENERATION
*RIGIDWALL

- **Case 13281**

It is now possible to encrypt a script to hide the source code.

- **Case 13280**

Support for *DEFINE_COORDINATE_xxx added to JavaScript

- **Case 13060**

Support for include files has been added to JavaScript.

- **Case 12989**

A new function Model.Merge() has been added to JavaScript to merge 2 models.

- **Case 12988**

Model.DeleteFlagged() can now take a second optional argument which says if deletion should be recursive.

If omitted then recursive is true (old behaviour)

- **Case 12053**

The Model class now has a layer property to allow the user to get/set the current layer (include file)

- **Case 11320**

A Parameter class has been added to JavaScript in PRIMER.

Seatsquash

- **Case 12381**

Added a 'STATUS' command for command line seat-squash. This will allow the user to see what has been defined and what they still have to define.

Selection

- **Case 13948**

Added the ability to filter on an object menu *DATABASE_CROSS_SECTION by the parts they reference in a part set.

- **Case 13466**

Object menu status (e.g. filtering settings) is not reset after selection from menu (previously it was).

- **Case 13333**

Whenever an 'object menu' is in use it is now possible, via the 'Options' popup menu (new in 9.4), to save the currently selected items on the clipboard for subsequent future use.

‘Add to clipboard’ adds them, performing a logical OR with the existing clipboard contents.

‘Remove from clipboard’ removes them (only if they are already in the clipboard)

‘Replace clipboard’ removes all current clipboard contents and replaces them with the current selection.

In addition all Object menus will now contain a 'Clipboard ...' row if multiple selection is legal in that context and the clipboard contains one or more items of the specified type. This provides a 'one click' way of reusing selections previously placed on the clipboard in any number of subsequent contexts.

- **Case 13294**

In Object Menu 'key in' boxes the syntax has been extended so that:
The use of a '-' to mean a range (eg '10 - 20') may be used instead of '10 : 20' or '10 to 20')
Both a comma and a semi-colon may now be used as field separators, (originally only a space was accepted).

- **Case 13288**

When creating or modifying a set, user can now add the explicit item type (e.g. Parts) as an alternative to specifying the object type to be added first.

- **Case 13210**

Added the ability to filter sets by their suffix (_ADD, _GENERAL etc.).

- **Case 12824**

When selecting nodes for creation of NRB's, you can now drag a box for selection rather than just selecting nodes one by one.

- **Case 12745**

In 'object menu' filters the ability to screen-pick the current filtering item has been added.

For 'filter by' categories that are screen-pickable (e.g. parts) the (new) 'Vis' button at the top of the filter menu becomes live and allows you to screen-pick the item to be used as a filter.

- **Case 12419**

For 2d and 3d elements, and also nodes, it is now possible to select 'Vis, Feature angle' in object menu picking.

This will extend a single pick across the surface (as defined by elements connected by a common edge) as long as the angle between adjacent elements is less than the feature angle specified.

In addition if the optional 'absolute' feature angle is set then the angle between an element's normal and that of the element originally picked must be less than the specified angle.

For nodes the outward normal of the original node is calculated from the average of the elements meeting at that node. Subsequent extrapolation across the surface is based on element normals, with the nodes on eligible elements being selected.

- **Case 12255**

Updated the 'help' text for filtering in object menus to clarify their usage.

- **Case 12160**

There has been a request for 'object menu' filtering to include a category 'by attached'.

There is already a 'by referenced' filter category which comes close to this. However, in Primer 9.3, when an item (e.g. node or element) was in a SET, ‘by referenced’ would not dig down to list items referencing that set. For example a node in usually 'referenced' by a *Constrained nodal rigid body via a node set, and this would not be detected.

Therefore 'by referenced' now contains that extra level of indirection so that when something is in a set then items using that set are included in the 'referenced by' list.

There is one limitation to this, which is that inclusion in a set is only detected where it is explicit, e.g. by *SET_xxx_LIST. If an item is in a set by virtue of *SET_GENERATE or *SET_GENERAL this is not detected since the amount of computation required would be prohibitive.

- **Case 12156**

An 'Invert' button has been added to the standard Object menu box making it possible to invert (reverse) the current selection: everything currently selected becomes unselected, and all items in the relevant category not previously selected now become selected.

The process is inherently reversible, so two consecutive 'Invert' operations return to the previous status.

Pick symbols on the screen and the 'cursor-picked list' are lost, meaning that the middle mouse button cannot be used to undo recent picks following an invert operation.

- **Case 10057**

Historically MODIFY, COPY and DELETE operations under keywords would return the selection menu to its initial state following an operation, meaning that any filter settings or menu scroll position were lost.

This has been changed, and the current selection menu will retain its position and other settings through these operations, and only the current selection will be unset.

- **Case 6586**

The ability to select items within a screen circle has been added to the 'Vis'ible options in Object Menu picking.

This works in much the same way as area picking: the user clicks on the centre of a circle and then drags out a radius. Everything within that radius is selected.

- **Case 6456**

Polygonal area picking can now close the polygon via a 'double click' (as well as the existing methods of clicking on the first point or pressing the 'Close Polygon' button.)

Shortcut

- **Case 12417**

A new keyboard shortcut has been added. pressing the 'y' (by default) key will cycle through 'No overlay', 'Free edge', and 'All edges' overlay plot modes.

- **Case 11262**

Shortcut keys are now user-definable, see Options=>Shortcuts. Javascripts and macros can be assigned to shortcut keys.

- **Case 10524**

More pre-programmed shortcuts have been added. They include the tools menus and plotting controls. They can be assigned to keys using the shortcuts panel.

Undo

- **Case 11218**

An undo capability has been added for node replace.

- **Case 5736**

An undo capability has been added for element splitting and simple meshing.

- **Case 5618**

An undo capability has been added for simple meshing.

- **Case 4210**

'Undo create' buttons have been added to the following *CONSTAINED edit panels:
GENERALISED_WELD
RIVET
SPOTWELD

- **Case 4110**

An undo capability has been added for node merge.

User interface

- **Case 14092**

Following a request to export the contents of 'help' and other listing boxes to other applications there is now a 'Copy to Clipboard' in the pull-down menu associated with the [-] button at the top left of menu sub-windows.

This does the following:

For text and listing windows (eg Help boxes) the text in the window is copied into the system clipboard as 'text'. This is the case on all operating systems.

On Windows platforms only, other window types are copied to the system clipboard as a bitmap of the window contents.

On X11-based window managers, ie Linux and Unix, this 'copy window as bitmap' operation is not performed because there is no standard for exchanging graphical data on these platforms.

- **Case 12375**

The factor for <Shift> or <Ctrl> + <right mouse> dynamic zooming is now configurable.
Its default value remains as before, but this can be changed on the Options > Menu attributes panel, in exactly the same way as the mouse scroll wheel factor. The values have been made the same as those for the scroll wheel: default 0.05, range 0.01 to 0.20.
This setting can also be saved in the 'oa_pref' file as 'czoom_factor', and is settable for individual programmes or as a global preference.

- **Case 5627**

Logic has been added to make mouse keys configurable during dynamic viewing. At present the options available are:

Rotate
Translate
Zoom (+ve upwards)
Zoom (+ve downwards)

Any function can be assigned to any mouse key for use with <shift> and <ctrl>.

These are editable in the 'menu attributes' editor common to all codes, and are stored in the oa_pref file.

These preferences can be stored per graphical programme (primer*, d3plot*, this*) or for all codes (oasys*)

Views

- **Case 11559**

A new 'locate target and eye' capability has been added to the View > Perspective panel.

This allows the user to specify or screen-pick both 'eye' (camera) and 'target' (what the camera is pointing at) positions, and PRIMER then recalculates the view transformation to achieve the appropriate view.

PRIMER attempts to determine an 'up' direction automatically (but not always successfully!) and this can be overridden by the user.

Write

- **Case 12902**

The ability to easily access output options when writing models from the clipboard or the include tree has been added.

- **Case 12874**

PRIMER now has the option of writing out all solid elements in 2-line format, rather than just 10 noded tetrahedral solid elements. This option has also been added to the preferences.

- **Case 12528**

By default, when the name of a keyword file is entered in a text box which has no extension, PRIMER will append '.key'. You may set a pref which will prevent this behaviour. If you do want

PRIMER to add extensions, you may set 2 prefs (one for master files, one for include files) which specify the extensions to be added.

3.2 Oasys D3PLOT

3.2.1 Enhancements in 9.4.2

Cut section

- **Case 15270**

When windows have been spread over multiple pages only those on the current page are visible. However when cut-sections were active and were being dragged using the mouse the images in all windows, including those not currently visible, were being updated which slowed down the response time unnecessarily.

This has been corrected and only those windows that are currently visible are now updated when the section is dragged.

Groups

- **Case 15199**

Binary groups (.grp) files are generated automatically by D3PLOT to manipulate any number of groups with arbitrary complexity, and also to 'remember' these across successive sessions using the same model.

However in some working environments this persistence becomes a nuisance and it is better to delete them when a D3PLOT session ends. Therefore a new preference:

d3plot*delete_group_file: true | false (default false)

has been added. If set to true then .grp files are deleted when a model is closed or when a D3PLOT session terminates.

Image

- **Case 15087**

A preference 'd3plot*image_format' has been added to select the default image format and can be set to:

BMP_8_C
BMP_8_UN
PNG_8
GIF_8
BMP_24_UN
JPG_24
PPM_24
PNG_24

- **Case 15023**

The /IMAGES dialogue input command did not contain the options to set whether to capture all pages, the current page or a specific window. These have been added in:

/IMAGES ALL_PAGES
/IMAGES CURRENT_PAGE
/IMAGES ONLY_WINDOW

User interface

- **Case 15187**

In D3PLOT 9.4.2 onwards the PART TREE menu can now be docked and undocked like PRIMER.

3.2.2 Enhancements in 9.4

Command files

- **Case 14244**

Command files in D3PLOT contain a dialogue entry in columns 1 to 80 and, possibly, 'button' data in columns 82 to <end of line>.

This limits the length of dialogue input to 80 characters on a line, and while it is possible to spread input over several lines by using column 81 as a continuation line marker this is clumsy.

Users who wish only to have 'dialogue' (command-line) commands in their files may add the line

*TEXT_ONLY (case insensitive, but must start at column 1)

to their command files to designate that the rest of file contains only dialogue commands, in which case the command interpreter will accept lines up to 256 characters long in these files.

In this case no 'button' data may be added, i.e. these are suitable only for 'command line only' files, and in addition the use of column 81 as a continuation character is ignored.

Note also that D3PLOT command-line syntax treats a back-slash at the end of a line as a continuation character, and any number of lines may be used for a single command by using this method. (However the limit of 256 characters on a single line remains, and input strings may not be spread over multiple lines separated by back-slashes.)

- **Case 4316**

When performing 'batch' mode post-processing driven by command files it is now no longer necessary to run D3PLOT on an actual display in order to capture images.

On both X11 based (Unix and Linux) and Windows platforms the command line argument '-batch' will cause all graphics to be performed without using the display. This includes capturing images to file.

Note that on X11 platforms access to an X server is still required, and if the default OpenGL graphics are to be used this server must support OpenGL rendering, however nothing will actually be drawn on the display of the server.

Contour

- **Case 14009**

A new data component E2D_PRINC_STRAIN_RATIO has been added, derived from the ratio of E2MIN_2D_PRINC_STRAIN / E2MAX_2D_PRINC_STRAIN.

If E2MAX_2D_PRINC_STRAIN is 0, the ratio is returned as -100 (E2MIN_2D_PRINC_STRAIN will

be negative) to avoid an infinite number.

The ratio is capped at -100 to avoid large values when E2MAX_2D_PRINC_STRAIN is relatively very small compared to E2MIN_2D_PRINC_STRAIN.

If both E2MAX_2D_PRINC_STRAIN and E2MIN_2D_PRINC_STRAIN are negative then the ratio is returned as 1.1 to distinguish it from the case when they are both positive. This is important in fracture prediction where compressive areas are of little interest.

- **Case 13546**

An option has been added to the CL (cloud plotting) button to allow a choice of display methods for element-derived data.

The default is raw element values displayed at element centres which is what Cloud plotting in previous versions showed.

The new alternative is nodally averaged values shown at node locations.

If nodally averaged results are chosen the result is equivalent to a low resolution contour plot, with element centre values not being shown. This tends to hide peak values.

(Cloud plotting of nodally derived data is unaffected by this setting as it will always show nodal data at node locations.)

- **Case 8217**

The ability to compute 2D (in-plane) principal stress and strain has been added for shell and thick shell elements.

These may also have their directions plotted as part of a Criterion plot.

Cut section

- **Case 11792**

Added further explanation to the 'help' texts in the cut-section panel to explain the sign convention of the forces and moments calculated.

Data access

- **Case 14245**

In cases where clients keep their data on 'read only' file systems D3PLOT is unable to create model-related files in the same directory as the data.

One solution proposed by a client with such a system is to defined a 'project current working directory' for a given analysis, or group of analyses, and to store project-related data in that directory.

In order to make this simpler to achieve during batch usage an optional command-line option '-pcwd=pathname' has been added which, if defined, will set the default path for the following files to :

view files (plot.view)
cut-section files (section.cut)
group files (groupnnn.asc)
settings files (D3PLOTnnn.set)
external (blob plot) data files.

This setting is entirely optional, and if not defined these files will default to the current working directory - typically that of the analysis currently being processed.

General

- **Case 13788**

If more than one model is loaded in the database the title text is now prefixed with the model number, 'Mn: '.

- **Case 13263**

In version 9.4 of D3PLOT the title of all the models in a graphics window can now be displayed instead of just the title from the first model. The option to control this setting is in the 'Display Options'->'Window Dressing' menu.

By default this option is set so that all the titles are displayed.

- **Case 11793**

The state selection menu for PTF COMPRESS now has the same options as Anim -> Set_States -> Custom.

Graphics

- **Case 13771**

Historically D3PLOT has plotted Airbag Particles on a 'per airbag' basis, with no means (other than contouring gas id) of manipulating the graphics via gas id in airbags.

A new 'Gas properties' sub-panel has been added under Display Options >Airbag Particle which gives the ability to control the display of airbag particle visibility, colour and leakage on a 'per gas' basis.

This panel is optional, and the default remains to work on a 'per airbag' basis as before.

- **Case 13409**

From version 9.4 onwards D3PLOT supports a new command line option '-batch'. If D3PLOT is run with this option then the main windows are no longer mapped. This means that D3PLOT can now be run in a 'batch' mode from within Reporter without the D3PLOT windows appearing.

- **Case 13376**

Historically D3PLOT has performed Velocity, Line Contour and Criterion plots by drawing arrows, lines or vectors on top of a 'hidden line' plot.

This has been criticised because 'hidden line' plotting gives little indication of the shape of the underlying mesh since it defaults to the background colour without lighting.

Therefore the default in release 9.4 has been changed so that the underlying elements in these plots are drawn in grey with lighting switched on. This does not clash with the data symbols and gives a better idea of the shape of the structure.

This mode can be controlled in Display Options, Hidden options, where the colour can be changed and also the original 'hidden line' infill can be selected.

These may also be set by the preferences:

D3PLOT*vector_fill_mode: SHADED | HIDDEN
D3PLOT*vector_fill_colour: WHITE | BLACK | GREY ... | BLUE | 0xrrggbb

- **Case 12607**

A 'Y' short-cut key which cycles through no edges, free edges, all edges has been added. This matches the same short-cut key in PRIMER.

(The 'Y' stands for overlaY)

- **Case 12483**

Historically principal stress and strain plots have provided control over symbol length, but not thickness. In addition they have been rendered against a 'hidden' background, and while this can be changed using mixed-mode plotting it is inconvenient to have to do so.

In release 9.4 the following changes have been made:
The symbol thickness remains 1 pixel by default, but this can now be changed up to a value of 20.
Rendering now takes place by default against a grey shaded and lit background rather than a 'hidden' one. This colour can be changed, and reversion to the original display method is also possible via an option in the ‘Display options’ menu.
In mixed mode plotting the previous default was always to draw symbols on all elements, even if their display mode was something other than 'current' (e.g. shaded, wire).
This default has now changed, and non-'current' elements no longer have principal stress symbols displayed on them. Reversion to the original behaviour is possible via an option in the ‘Display options’ menu.
An explanatory popup menu has been added to the criterion plot button ('Go'), which also provides a quick link to the display options menu that controls the settings described above.

Groups

- **Case 13862**

If you had three groups 'RIG', 'INPUT' and 'INPUT RIG', for example, then you couldn't blank the last two groups using dialogue commands because D3PLOT complained that the names were ambiguous.

To get around this, group names can now be enclosed in single quotes in which case D3PLOT will only look for an exact match.

- **Case 13435**

In 9.3.1 an optional set of 'properties' information could be manually written to the ascii groups file, but on writing this out the information was lost.

In 9.4 the ability to write this information out has been added.

Image

- **Case 12915**

The background can be set to white when capturing static images. Once the image is captured, the original background colour is restored.

Include

- **Case 13454**

Include files are available to select in the blank, colour, write and x-y data panels along with their command line equivalents.

Include files can now also be quick-picked.

Metal forming

- **Case 13918**

An option has been added on the metal forming panel to select the states used in the ‘Strain Path’ plot. Previously all states were plotted.

- **Case 12884**

Curves can now be blanked/unblanked in a FLD Strain Path plot by clicking on the symbol in the key area. All curves can be blanked/unblanked with the 'Sel All' and 'Unsel All' buttons at the top of the plotting window.

Read

- **Case 11836**

Femzipped files can be read into D3PLOT.

- **Case 4814**

The reading of data in D3PLOT has been threaded (i.e. parallelised) so that a 'helper' thread is reading ahead data for the next state while the current state is being processed.

This speeds up data import a bit since the wait for data to arrive from disk is no longer 'dead' time, and can be used to perform useful work.

Scripting

- **Case 13722**

The functions LockState() and UnlockState() have been added to the Javascript interface.

These are useful when data from more than one state is referenced within a loop, as they enable the Javascript programmer to designate the states in question as 'locked', meaning that the D3PLOT memory manager will not reuse memory from them.

If this is not done the situation can arise where memory for state P is 'scavenged' from state Q, then lower down in the loop state Q grabs it back again from state P. This 'churning' can result in repeated rereading of data from disk to repopulate the memory, and very slow execution speeds.

Selection

- **Case 14040**

The command line selection option '%' has been added, meaning 'all visible'.

For example

/WRITE NODE %

Selects all currently visible nodes for a WRITE operation.

Shortcut

- **Case 13452**

New pre-programmed shortcuts have been added including the Tools menu panels and contouring options. They can be assigned to keys using the new shortcuts panel.

- **Case 12623**

The shortcut 'Y' has been added to Primer and D3PLOT to cycle through free edge plotting modes.

User interface

- **Case 14172**

A 'Help' button has been added to the top bar which gives access to:
User manual
What's new (list of files in /manuals/new_features directory)
Support info
About (code version and build date)
In addition the configuration of .pdf and .html browsers has been largely automated, although the user may still override this by defining an application on Unix and Linux platforms via a preference.

(This is logged for D3PLOT, but has also been applied to PRIMER and T/HIS)

- **Case 12385**

In version 9.4 the filename for an analysis can be displayed in a graphics window instead of the model title if required.

The option to control this setting is in the 'Display Options'->'Window Dressing' menu.

- **Case 12366**

An 'update' button has been added to the ‘Display Options’, and also the 'Overlay' panel (as invoked from Display > Overlay).

These make it possible to see immediately the effects of any changes.

- **Case 12292**

A list of keyboard shortcuts can be now be displayed through the top menu Options->List of shortcuts. It can also be accessed with the '?' key.

- **Case 9119**

In ‘Utilities >Target markers’, and also ‘Trace nodes’ it was possible to screen-pick multiple nodes but only to key them in one at a time.

This limitation has been removed and a list of explicit node numbers may now be entered in the 'key in' box in this context.

(However note that a range of node ids, as in '1 to 20', is not supported. This is because these two contexts do not necessarily have a unique 'parent' model, making processing ranges of node ids problematical.)

Views

- **Case 13861**

Views can now be selected by name as well as number in the /VIEW dialogue commands.

- **Case 13746**

A new 'Target & Eye' option has been added under the Viewing menu that allows the user to set the camera position (eye) and the target point at which the camera is pointing.

Write

- **Case 12616**

An option has been added to write XY data to a csv file instead of a curve file. The data can be written in two formats: X,Y,X,Y,X,Y or X,Y,Y,Y,Y.

3.3 Oasys T/HIS

Compare

- **Case 12868**

A new curve comparison function COR3 has been added. The output is a single value describing the correlation of the two curves. See manual for details.

Data access

- **Case 13860**

Both mass and “added mass” are now available for a PART from the ASCII MATSUM file. The “added mass” is calculated by subtracting the total mass as time 0 from the total mass at any given time. The “added mass” will not include any mass added at time zero for time step stability.

If a model contains the card
*DATABASE_GLSTAT_MASS_PROPERTIES

instead of a

*DATABASE_GLSTAT

then T/HIS will 9.4 will now read the 'Total mass' for a model from the GLSTAT file as well as the normal 'added mass' value.

- **Case 13754**

Version 9.4 of T/HIS now supports the TPRINT ASCII file. The data components supported from this file are:

NODE - Temperature
NODE - X Thermal Flux
NODE - Y Thermal Flux
NODE - Z Thermal Flux
NODE - Thermal Flux Magnitude

These data components are accessible under the NODE menu.

- **Case 13739**

Version 9.4 of T/HIS now supports a number of new data components from the DBFSI ASCII file and it also now supports the DBSENSOR file. Results for both of these files are accessed via the FSI option in the main data panel which now has 2 data sub-categories; Surfaces (DBFSI) and Sensors (DBSENSOR).

- **Case 13228**

Version 9.4 of T/HIS now supports the 'torsion' field in the SWFORC ASCII file and BINOUT file.

- **Case 12846**

T/HIS 9.4 can now read the 'relax' ASCII file that is generated during dynamic relaxation. This file contains 4 values

current distortional ke
maximum distortional ke
convergence factor
total ke

As these are 'model' values the 4 component buttons for these are labelled as

DRCE - DR Current Kinetic energy
DRMX - DR Maximum Kinetic energy
DRCO - DR Convergence Factor
DRKE - DR Total Kinetic energy

and can be found at the end of the list of 'Model' data components

Fasttcf

- **Case 12349**

In T/HIS 9.4 a new option to 'Blank existing curves' has been added to the FAST-TCF ‘Run’ menu. If this option isn't selected then any curves produced by a FAST-TCF script will now be added to any unblanked curves in graphs. Previously all existing curves we automatically blanked when a script was run.

- **Case 7880**

When opening a 2nd or subsequent model in T/HIS version 9.4 onwards now contains a new option to automatically extract a set of curves from the new model based on what has already been read in from another model.
As well as automatically extracting the same curves this option also allows a specific set of curve properties (colour, width, line style) to be specified for all of the curves read from the new model.

General

- **Case 13077**

In T/HIS 9.3 the PC file selection menu would only list *.cur files when the T/HIS curve output format was set to NASTRAN TABELD1. In version 9.4 this has been changed so that it now lists *.nas, *.dat and *.cur files.

Graphics

- **Case 11969**

If in T/HIS 9.4 multiple curve files are read, the graphs are now replotted only once, after all the files have been read. In previous releases the graphs would be replotted after each file was read.

- **Case 11842**

In T/HIS 9.4 the labelling of axes values when using a logarithmic scale has been revised so that when zoomed into a small region of the graph at least 2 axis values will always be displayed.

- **Case 11678**

T/HIS 9.4 contains a new ‘Curve Properties’ menu that can be used to control the display of min/max curve values and injury criteria values. This menu can be used to automatically append values to the curve legend or to display the values within the graph area. As well as displaying the values in the graph area the colour, font, background colour, transparency and position of the labels can also be modified.

Groups

- **Case 12346**

In T/HIS 9.4 a curve group is automatically created for each model that is opened in T/HIS and any curves that are read from that model are automatically added to the curve group. One additional curve group is also automatically created for any curves that do not belong to a model. These 'automatic' curve groups cannot be modified.

Image

- **Case 12930**

The background can be set to white and foreground to black when capturing images. Once the image is captured, the original background and foreground colours are restored.

Menus

- **Case 13063**

In T/HIS 9.3, when editing a curve, the popup menu that is displayed when you right-mouse click on a curve had an option labelled QUIT. This option would actually exit from the curve editor and this wasn't obvious. In version 9.4 the label on this button has been changed to 'Quit from Edit' and a new 'Dismiss Menu' button has been added that will close the popup menu.

- **Case 12403**

In T/HIS 9.4 the full path name of model directories can now be displayed in the curve manager menu by hovering the mouse over the button containing the model directory.

- **Case 11665**

From version 9.4 onwards the environment variable MENU_AUTO_CONFIRM can now be set interactively from within a program. This setting can be found in the 'Menu Attributes' menu.

Operations

- **Case 13174**

The FFT function now writes out a phase curve as well as the magnitude.

- **Case 10481**

A normalise function for the x-axis has been added to the ‘Operate’ and ‘Automotive’ panels.

- **Case 7585**

A new function (MON) has been added in the ‘Operations’ menu that will make a curve monotonic in x.

- **Case 4270**

An ‘Inverse FFT’ function has been added to the ‘Seismic’ menu. It takes either ‘Magnitude and Phase’ or ‘Real and Imaginary’ curves in the frequency domain and outputs a curve in the time domain.

Output

- **Case 13642**

A new data component ‘Plastic Strain Magnitude’ (PEMAG) has been added to T/HIS and D3PLOT. This is an averaged scalar term reflecting the maximum plastic strain related to the inelastic strain tensor at a given location.

It is derived from the stress and strain tensor and requires the Young's modulus and Poisson's ratio to calculate it. These are stored on a per part basis in the ZTF file. The component is not available if any one of these is not present.

Preferences

- **Case 13995**

The following preferences have been added to control the display of T/HIS:

'border_on' default TRUE
'border_colour' default FOREGROUND
'axis_colour' default FOREGROUND

'plot_format' already existed, but was missing the option 'floating' in the preference editor.

- **Case 13458**

In T/HIS 9.4 the oa_pref file settings can now contain Environment variables which will be automatically expanded by T/HIS.

Shortcut

- **Case 13229**

T/HIS 9.4 now has keyboard shortcuts to zoom in and out of a graph, as in D3PLOT and PRIMER. By default these shortcuts are mapped to the + and - keys.

- **Case 11860**

In T/HIS 9.4 the shortcut key '0' will now set the minimum and maximum axes values of all the graphs that are currently active to the same as those of the graph in which the shortcut was pressed.

- **Case 11687**

In T/HIS 9.4 a new shortcut key 'Y' has been added that will autoscale the Y axis using the values of the visible points on a curve instead of the minimum and maximum values of the curve.

Units

- **Case 6572**

From version 9.4 onwards all of the data components that T/HIS can read from LS-DYNA results files have a unit code associated with both the X and Y axis values.

T/HIS now contains 6 built-in unit systems and if the unit system for a model is specified T/HIS can automatically add unit labels to the x and y axis. As well as being able to display unit labels T/HIS 9.4 can also convert results from one unit system to another.

To make it easier to compare results with data read in from either a CSV file or a T/HIS curve file, both of these file formats can now contain information on the unit system and the x and y axis units.

When carrying out curve operations T/HIS will look at the units for both the x and y axis and handle them intelligently. If for example a velocity is differentiated, the y axis of the output curve will have the unit label 'acceleration'.

3.4 Oasys Reporter

Capture

- **Case 13757**

Once a 'Capture' has been done for D3PLOT or FAST-TCF objects the 'Capture' button is changed to say 'Update capture' as it was not clear that pressing the button again would allow you to change the existing capture rather than starting again from scratch.

Generate

- **Case 13888**

When generating a report more feedback is now given in the status bar so you know what REPORTER is doing (e.g. running a D3PLOT object in background).

- **Case 11271**

Report generation can now be stopped at any point by a new 'Stop' button in the status bar

Graphics

- **Case 12854**

It is now possible to crop images in Image, ImageFile, D3PLOT and FAST-TCF objects in REPORTER.

Preferences

- **Case 12316**

REPORTER now reads the preferences oasys*file_names, oasys*maximise and oasys*start_in.

Process

- **Case 10709**

D3PLOT and T/HIS can now be run from REPORTER without any windows being mapped by either giving the -batch command line option to REPORTER or by setting the batch mode checkbox in File->Program locations. Additionally REPORTER can be minimised during report generation so you can use other programs.

Scripting

- **Case 13503**

User defined script directories can now be defined by using the library_directory preference. This allows users to add their own library scripts if REPORTER is installed in a read only location.

Text

- **Case 8631**

Text wrapping, border style, border colour and background colour have been added to the ‘textfile’ object.

User interface

- **Case 13430**

Exiting from REPORTER using File->close and using the top right window close button now gives the same error message and options to save any modified templates. Previously the messages were different and this caused confusion to some users.

3.5 Oasys Shell

Preferences

- **Case 13455**

In the 9.4 SHELL the oa_pref file settings can now contain Environment variables which will be automatically expanded by the Shell.

- **Case 13241**

Preferences are now read from oa_pref files in the four directories OA_ADMIN, OA_INSTALL, OA_HOME and CWD in that order and can be locked using a '#' instead of a '*', e.g. shell#d3plot_version. Any locked preferences cannot be changed when reading preferences from subsequent directories, e.g. if a preference is locked in the oa_pref file in OA_ADMIN, this prevents the preference being changed by the oa_pref file in OA_INSTALL, OA_HOME, or CWD.

Previously 'shell' preferences were only read from the OA_INSTALL (OASYS) directory so that users could not change the system settings (e.g. job_memory and queue_memory etc). The code now looks in both the OA_ADMIN_xx and OA_INSTALL directories processing all the 'shell' preferences.

Some 'shell' preferences can now also be read from the OA_HOME and CWD (the system administrator could lock them if required using 'shell#' rather than 'shell*'). These are:

shell*file_names
shell*file_size
shell*write_ctf
shell*write_ztf
shell*batch_display
shell*keep_files
shell*d3plot_version
shell*d3plot64_version
shell*d3plot_default
shell*this_version
shell*this64_version
shell*this_default
shell*primer_version
shell*primer64_version
shell*primer_default
shell*reporter_version
shell*default_cpus
shell*default_mpp_cpus
shell*manual_reader
shell*temp_folder